

August 20, 2003

File 348:EUROPEAN PATENTS 1978-2003/Aug W02

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File 349:PCT FULLTEXT 1979-2002/UB=20030814,UT=20030807

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| Set | Items | Description |
|-----|---------|--|
| S1 | 170453 | TELEPRESENCE? OR (VIRTUAL? OR ARTIFICIAL OR AUGMENT?) () (ENGINEERING OR ENVIRONMENT? OR TOOL? OR WORLD?) OR VIR OR VR OR VRML OR AR OR SIMULATOR OR SIMULATION OR CAVE OR STEREOSCOP? - OR TELEROBOT? OR UT |
| S2 | 212706 | INTERNET? OR INTRANET? OR EXTRANET? OR WEB OR WEBSITE? OR - WEBPAGE? OR NET OR PORTAL? OR CYBERSPACE? |
| S3 | 552831 | TELEOPERAT? OR OPERATOR? OR USER? OR PATRON? OR M?N OR WOM-?N OR ENDUSER? OR CLIENT? |
| S4 | 8053 | HEADSET? OR HEAD()MOUNTED()DISPLAY OR HMD OR HEAD() (SET? OR TRACK?) OR HELMET? |
| S5 | 1101865 | CONTROL? OR MANIPULAT? OR GOVERN? OR MASTER? OR COMMAND? OR AUTHORITY OR DOMINAT? OR RULE? OR REIGN? OR HANDL? |
| S6 | 1084135 | MOVE? OR MOVING OR ACTIV? OR 6DOF OR 3DOF OR (SIX OR 6 OR - THREE OR 3) ()DEGREES()OF()FREEDOM OR ROTAT? OR MANEUVER? |
| S7 | 713453 | ELSEWHERE OR ELSE()WHERE OR REMOTE OR APART OR DISTANT OR - FAR()OFF OR FAR()AWAY OR OFF()LYING OR OFF()SITE? OR OFFSITE? OR OUT()LYING OR REMOVED OR (ANOTHER OR OTHER OR DIFFERENT) (2-W) (LOCATION? OR SITE? OR PLACE?) OR OUTLYING |
| S8 | 226 | S1(S)S3(S)S4 |
| S9 | 106 | S8(S)S6 |
| S10 | 31 | S7(S)S9 |
| S11 | 15847 | S3(5N)S5(5N)S6 |
| S12 | 297 | S11(S)S1 |
| S13 | 11 | S12(S)S4 |
| S14 | 8 | S13 NOT S10 |
| S15 | 47 | S12(S)S2 |
| S16 | 46 | S15 NOT (S14 OR S10) |
| S17 | 76 | S11(S)S4 |
| S18 | 62 | S17 NOT (S16 OR S14 OR S10) |
| S19 | 11 | S12 AND IC=G09G-005/00 |
| S20 | 11 | S19 NOT (S18 OR S16 OR S14 OR S10) |
| S21 | 13 | S8 AND IC=G09G-005/00 |
| S22 | 7 | S21 NOT (S20 OR S18 OR S16 OR S14 OR S10) |
| S23 | 3834 | S5(3N)S6(3N)S7 |
| S24 | 10 | S23(S)S4 |
| S25 | 46 | S23(S)S1 |
| S26 | 1 | S25(S)S4 |
| S27 | 22 | S10/TI, AB, CM |
| S28 | 0 | S27 NOT (S20 OR S18 OR S16 OR S14 OR S10) |
| S29 | 22 | S27 NOT (S20 OR S18 OR S16 OR S14) |
| S30 | 2 | S20(S)S7 |

August 20, 2003

14/5,K/1 (Item 1 from file: 348)
DIALOG(R)File 348:EUROPEAN PATENTS
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00916541

VIRTUAL ENVIRONMENT INTERACTION AND NAVIGATION DEVICE
VORRICHTUNG ZUR INTERAKTION UND NAVIGATION IN EINER VIRTUELLEN UMGEBUNG
DISPOSITIF D'INTERACTION ET DE NAVIGATION DANS UN ENVIRONNEMENT VIRTUEL
PATENT ASSIGNEE:

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PATENT (CC, No, Kind, Date): EP 846286 A1 980610 (Basic)

EP 846286 B1 020220

WO 9750029 971231

APPLICATION (CC, No, Date): EP 97915632 970416; WO 97IB410 970416

PRIORITY (CC, No, Date): GB 9613315 960625

DESIGNATED STATES: DE; FR; GB

INTERNATIONAL PATENT CLASS: G06F-003/00

CITED PATENTS (EP B): WO 92/18925 A; US 5185561 A; US 5583526 A

NOTE:

No A-document published by EPO

LEGAL STATUS (Type, Pub Date, Kind, Text):

Examination: 010523 A1 Date of dispatch of the first examination
report: 20010406

Application: 980415 A1 International application (Art. 158(1))

Oppn None: 030212 B1 No opposition filed: 20021121

Grant: 020220 B1 Granted patent

Application: 980610 A1 Published application (A1with Search Report
;A2without Search Report)

*Assignee: 980826 A1 Applicant (name, address) (change)

Examination: 980930 A1 Date of filing of request for examination:
980630

LANGUAGE (Publication,Procedural,Application): English; English; English

FULLTEXT AVAILABILITY:

| Available Text | Language | Update | Word Count |
|------------------------------------|-----------|--------|------------|
| CLAIMS B | (English) | 200208 | 453 |
| CLAIMS B | (German) | 200208 | 463 |
| CLAIMS B | (French) | 200208 | 549 |
| SPEC B | (English) | 200208 | 1829 |
| Total word count - document A | | | 0 |
| Total word count - document B | | | 3294 |
| Total word count - documents A + B | | | 3294 |

...SPECIFICATION animal or mechanistic, form in a computer-generated
virtual environment.

The form taken by the **virtual environment** will depend on the
intended use of the system and may, for example, comprise the...

...urban or surreal landscapes for games or other applications, around
which environment a virtual body **controlled** by the **user** is **moved**.
The form of the virtual body may vary as required by the application,
from little...

...terms of available processor power for rendering of such models. In the
following, the term "**virtual environment**" will be used for such
virtual landscapes or situations: the term "physical environment" will be
...

August 20, 2003

...example a room in which the user contacts the various hardware devices, such as a **head - mounted display (HMD)**, which provide the interface to the **virtual environment**. The terms "virtual body" and "physical body" should be construed accordingly.

One example of a...such an apparatus is illustrated in Figure 1 which shows a plan view comprising a **stereoscopic HMD** unit 10 driven by a CPU 12 to display images of a **virtual environment** from a movable viewpoint. The images of the environment are based on data from an...

...the virtual body within the environment (such as a hand or claw which may be **moved** by the **user** and used to **manipulate** objects within the **virtual environment**) are based on data in a read only memory 16 also coupled with the CPU...

...image, such as shown in Figure 2, of a hand or claw floating within the **virtual environment**. Whilst the button 20 on the **control device** 18 is not depressed, the three-dimensional **movements** that the **user** makes with the **control device** 18 are replicated by the **movements** of the virtual hand 26 within the **virtual environment**. The movements of the **HMD** 10 are also replicated in changes to the location of viewpoint from which the image of the **virtual environment** is rendered, although it will be appreciated that this movement will be limited as physical...

14/5,K/2 (Item 1 from file: 349)
DIALOG(R)File 349:PCT FULLTEXT
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00857213 **Image available**

THREE DIMENSIONAL HUMAN-COMPUTER INTERFACE
INTERFACE HOMME-MACHINE TRIDIMENSIONNELLE

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Legal Representative:

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Patent and Priority Information (Country, Number, Date):

Patent: WO 200190870 A1 20011129 (WO 0190870)
Application: WO 2001GB2144 20010517 (PCT/WO GB0102144)
Priority Application: GB 200012275 20000522

Designated States: AE AG AL AM AT AU AZ BA BB BG BR BY BZ CA CH CN CO CR CU

CZ DE DK DM DZ EC EE ES FI GB GD GE GH GM HR HU ID IL IN IS JP KE KG KP
KR KZ LC LK LR LS LT LU LV MA MD MG MK MN MW MX MZ NO NZ PL PT RO RU SD
SE SG SI SK SL TJ TM TR TT TZ UA UG US UZ VN YU ZA ZW

(EP) AT BE CH CY DE DK ES FI FR GB GR IE IT LU MC NL PT SE TR

(OA) BF BJ CF CG CI CM GA GN GW ML MR NE SN TD TG

(AP) GH GM KE LS MW MZ SD SL SZ TZ UG ZW

(EA) AM AZ BY KG KZ MD RU TJ TM

Main International Patent Class: G06F-003/00

International Patent Class: G06F-003/033

Publication Language: English

Filing Language: English

Fulltext Availability:

Detailed Description

Claims

Fulltext Word Count: 3847

August 20, 2003

English Abstract

A Human-Computer Interface that comprises a set of sensors, actuators and computer generated controls is characterised in that the controls are projected in three spatial dimensions by a three dimensional display device and are manipulated by means of an operator interacting with them by movements of the operator's body, these movements being detected using the sensor system, where characteristics of a displayed target volume change according to the movement made, and actuators worn on the body, react according to how the body interacts with the computer generated controls.

French Abstract

L'invention concerne une interface homme-machine comprenant une serie de capteurs, d'actionneurs et de commandes controlees par ordinateur. Cette interface est caracterisee par le fait que les commandes sont projetees en trois dimensions spatiales par un dispositif d'affichage en trois dimensions et qu'elles sont manipulees par un operateur interagissant avec elles moyennant des mouvements de son corps. Ces mouvements sont detectes par le groupe-capteur, les caracteristiques d'un volume cible projete changent en fonction du mouvement effectue, et les actionneurs portes sur le corps de l'utilisateur reagissent en fonction de l'interaction entre le corps et les commandes generees par l'ordinateur.

Legal Status (Type, Date, Text)

Publication 20011129 A1 With international search report.

Publication 20011129 A1 Before the expiration of the time limit for amending the claims and to be republished in the event of the receipt of amendments.

Examination 20020214 Request for preliminary examination prior to end of 19th month from priority date

Fulltext Availability:

Detailed Description

Detailed Description

... which to work. To counter this, there are 3D lo visualisation systems, such as the **CAVE** system supplied by the **Virtual Environment** Lab, Virginia Tech, Blacksburg VA 24081, which provide the operator with a true 3D image...

...the walls of which are projected images that are viewed as 3D using a suitable **headset**. These systems, although useful for visualisation, are not currently suited for designo According to the...

...controls are projected in three spatial dimensions by a three dimensional display device and are **manipulated** by means of an **operator** interacting with them by **movements** of the **operator**'s body, these **movements** being detected using the sensor system, where characteristics of a displayed target volume change according...

14/5,K/3 (Item 2 from file: 349)

DIALOG(R)File 349:PCT FULLTEXT

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00747454 **Image available**

SYSTEMS AND METHODS FOR IMPROVED TELEPRESENCE

SYSTEMES ET PROCEDES ASSURANT UNE TELEPRESENCE AMELIOREE

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August 20, 2003

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Patent and Priority Information (Country, Number, Date):

Patent: WO 200060868 A1 20001012 (WO 0060868)

Application: WO 2000US8921 20000404 (PCT/WO US0008921)

Priority Application: US 99127826 19990405

Designated States: AE AL AM AT AU AZ BA BB BG BR BY CA CH CN CR CU CZ DE DK

DM EE ES FI GB GD GE GH GM HR HU ID IL IN IS JP KE KG KP KR KZ LC LK LR

LS LT LU LV MA MD MG MK MN MW MX NO NZ PL PT RO RU SD SE SG SI SK SL TJ

TM TR TT TZ UA UG UZ VN YU ZA ZW

(EP) AT BE CH CY DE DK ES FI FR GB GR IE IT LU MC NL PT SE

(OA) BF BJ CF CG CI CM GA GN GW ML MR NE SN TD TG

(AP) GH GM KE LS MW SD SL SZ TZ UG ZW

(EA) AM AZ BY KG KZ MD RU TJ TM

Main International Patent Class: H04N-007/18

Publication Language: English

Filing Language: English

Fulltext Availability:

Detailed Description

Claims

Fulltext Word Count: 6396

English Abstract

The present invention provides a modular, flexible system for deploying multiple video perception technologies. The telepresence system of the present invention is capable of allowing an operator to control multiple mono and stereo video inputs in a hands-free manner. The raw data generated by the input devices (22) is processed into a common zone structure that corresponds to the commands of the user, and the commands represented by the zone structure are transmitted to the appropriate device. The modularized approach permits input devices to be easily interfaced with various telepresence devices. Additionally, new input devices and telepresence devices are easily added to the system and are frequently interchangeable. The present invention also provides a modular configuration (36) component that allows an operator to define a plurality of views each of which defines the telepresence devices to be controlled by a particular input device. The present invention provides a modular flexible system for providing telepresence for a wide range of applications. The modularization of the software components combined with the generalized zone concept allows the systems and methods of the present invention to be easily expanded to encompass new devices and new uses.

French Abstract

L'invention concerne un systeme modulaire souple permettant de deployer une multitude de technologies de perception video. Le systeme de telepresence est en mesure d'assurer a un utilisateur la commande par la technique main libre de multiples entrees video mono et stereo. Les donnees brutes generees par les dispositifs de saisie (22) sont traitees et converties en une structure de zone commune correspondant aux commandes de l'utilisateur et ces commandes representees par la structure de zone sont transmises au dispositif adequat. La modularite permet l'interfacage aise des dispositifs de saisie avec d'autres dispositifs de telepresence. Par railleurs, ces nouveaux dispositifs de saisie et de telepresence sont facilement ajoutes au systeme et souvent remplaces. L'invention concerne egalement un element de configuration modulaire (36) permettant a l'utilisateur de definir une pluralite de vues, chacune definissant les dispositifs de telepresnece commandes par un dispositif de saisie particulier. L'invention concerne en outre un systeme modulaire souple servant a assurer la telepresnece pour une grande variete d'applications. La modularisation des elements logiciels combinee a la notion de zone generalisee facilite l'evolution des systemes et procedes

August 20, 2003

precites qui peuvent ainsi prendre en charge de nouveaux dispositifs et de nouvelles utilisations.

Legal Status (Type, Date, Text)

Publication 20001012 A1 With international search report.

Publication 20001012 A1 Before the expiration of the time limit for amending the claims and to be republished in the event of the receipt of amendments.

Fulltext Availability:

Detailed Description

Detailed Description

... s head. In the case of a zoom camera, for example, the forward and backward movement of an operator 's head may be 5 interpreted as a command to cause a camera to zoom in or out. Alternatively, the forward and backward movement of an operator 's head could also be interpreted as a command to physically move the camera either forward or backward. The actual implementation can be configured as needed.

However...

...1 00 is interpreted as no motion and is present essentially to ensure that inadvertent movements are not interpreted as a movement command. Thus, when an operator is using a headset, the operator 's head does not need to be held perfectly still and slight head movements will ...

14/5,K/4 (Item 3 from file: 349)

DIALOG(R)File 349:PCT FULLTEXT

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00542693 **Image available**

FIRST DRAFT-SWITCHING CONTROLLER FOR PERSONAL ANR SYSTEMS

AVANT-PROJET DE CONTROLEUR DE SYSTEMES ANR PERSONNELS

Patent Applicant/Assignee:

SAUNDERS William R,
VAUDREY Michael A,

Inventor(s):

SAUNDERS William R,
VAUDREY Michael A,

Patent and Priority Information (Country, Number, Date):

Patent: WO 200006066 A1 20000210 (WO 0006066)

Application: WO 99US16292 19990726 (PCT/WO US9916292)

Priority Application: US 98123974 19980727

Designated States: AT AU BR BY CA CH CN CZ DE DK ES FI GB HU ID IL IN IS JP
KR LT LU LV MX NO NZ PL PT RU SE TR UA US VN

Main International Patent Class: A61F-011/06

Publication Language: English

Fulltext Availability:

Detailed Description

Claims

Fulltext Word Count: 9803

English Abstract

This invention relates to a unique control approach that provides a means for manual or automated switching of narrowband controllers in personal active noise reduction (ANR) systems. A second related innovation links the human auditory system's physiological features to the design of a specific switching controller that implements ANR technology in audiometric testing. The design incorporates a speaker (7) as an actuator that modifies the microphone (9) sensor to reject the ambient noise. A summing junction (11) is included prior to speaker amplifier to add the controller (10) output to the prefiltered (5)

August 20, 2003

audiometry (4) test signal. For a given control objective of narrowband acoustic disturbance rejection, an analog or digital feedback controller can be designed to accomplish this goal over the precise bandwidth of the disturbance(s). The new switching controller which is the key element of this invention requires that multiple feedback controllers be integrated with the personal ANR system, each one designed for maximum suppression/minimum spillover over specific and different narrowbands of frequencies.

French Abstract

L'invention porte sur un concept unique de commande relatif a un moyen de commutation manuelle ou automatique d'un controleur de bandes etroites de systemes personnels de reduction active du bruit (ANR). Une deuxieme innovation associee relie les caracteristiques physiologiques du systeme auditif de l'homme a un controleur specifique de commutation mettant en oeuvre la technique ANR pour des tests audiometriques. Ledit controleur comporte un haut-parleur (7) servant a modifier le detecteur du microphone (9) pour rejeter le bruit ambiant. Une liaison (11), disposee avant l'amplificateur de sommation du haut-parleur ajoute le signal de sortie du controleur (10) au signal prefiltre (5) du test d'audiometrie (4). Pour un objectif donne de commande de la rejection des perturbations acoustiques a bande etroite, on peut concevoir un controleur analogique ou numerique a retroaction atteignant ce but pour la bande precise des perturbations. Le nouveau controleur de commutation qui est l'element clef de l'invention requiert l'integration au systeme ANR personnel de plusieurs controleurs a retroaction dont chacun est concu pour une suppression maximale/et un debordement minimal sur des bandes etroites de frequences specifiques et differentes.

Fulltext Availability:

Detailed Description

Detailed Description

... be automatically determined based on quantitative data or they may be determined by the end user as in the application described next.

Active noise control headsets used for hearing protection and improved speech intelligibility in high noise environments are fairly common...

14/5,K/5 (Item 4 from file: 349)

DIALOG(R)File 349:PCT FULLTEXT

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00415562 **Image available**

**VIRTUAL ENVIRONMENT MANIPULATION DEVICE MODELLING AND CONTROL
MODELISATION ET COMMANDE POUR DISPOSITIF DE MANIPULATION DANS UN
ENVIRONNEMENT VIRTUEL**

Patent Applicant/Assignee:

PHILIPS ELECTRONICS N V,
PHILIPS NORDEN AB,

Inventor(s):

GALLERY Richard David,
SHAH Jain Kumar,
HERON Dale Robert,

Patent and Priority Information (Country, Number, Date):

Patent: WO 9806023 A2 19980212

Application: WO 971B806 19970701 (PCT/WO IB9700806)

Priority Application: GB 9616261 19960802

Designated States: JP KR AT BE CH DE DK ES FI FR GB GR IE IT LU MC NL PT SE

Main International Patent Class: G06F-003/00

Publication Language: English

Fulltext Availability:

August 20, 2003

Detailed Description
Claims

Fulltext Word Count: 5654

English Abstract

A method and apparatus are provided for providing user-directed operation of a virtual manipulator, such as a simulated hand or claw (30) within a computer-generated virtual environment. The environment comprises one or more objects (32) which may be held, released or impelled by the manipulator under user control. Movement of the virtual manipulator is directed by a suitable hand-held device operated by a user, with a simple control directing opening or closing of the claw (30). In operation, actions such as throwing, catching or punching an object (32) are partially automated, with the decision as to the action initiated being determined by the separation (D) between object and manipulator, and the current and previous states of each as recorded in the form of respective state variables. A method for the derivation of an applied velocity for the object acted upon is also described.

French Abstract

Cette invention se rapporte a un procede et un appareil permettant a un utilisateur de gerer l'action d'un manipulateur virtuel, tel qu'un gant ou une pince simulee (30) a l'interieur d'un environnement virtuel produit par ordinateur. Cet environnement contient un ou plusieurs objets (32) qui peuvent etre saisis, relaches ou propulses par le manipulateur sous le controle de l'utilisateur. Les mouvements du manipulateur virtuel sont geres par un dispositif manuel approprie actionne par l'utilisateur, lequel gere par une simple commande l'ouverture ou la fermeture de la pince (30). En mode d'utilisation, les actions telles que lancer, attraper ou frapper un objet (32) sont partiellement automatisees, la decision concernant l'action a entreprendre etant determinee par la separation (D) entre l'objet et le manipulateur, et les etats presents et passes de chacune de ces actions etant enregistres sous la forme de variables d'etats respectifs. Cette invention presente egalement un procede permettant de deriver la vitesse appliquee a l'objet sur lequel porte l'action.

Fulltext Availability:
Detailed Description

Detailed Description

... users limb and reproduce such movements within a virtual environment.

The form taken by the **virtual environment** will depend on the intended use of the system and may, for example, comprise the...

...or surreal landscapes for games 1 5 or other applications, around which environment a virtual **manipulator controlled** by the **user is moved**. The modelled form of the virtual **manipulator** may vary as required by the application (along with the form of the virtual objects...

...pads of an octopus) to mechanical equivalents and specialised tools. Whatever the particular form, the **manipulator** must be able (under direct or indirect **user control**) to hold an object (such that it may be **moved** or stopped from movement by the manipulator), it must be able to release an object...

...to an object (pushing) without having first to hold it. In the following, the term "**virtual environment**" will be used for all such computer-generated virtual landscapes or situations: the term "physical ...

...example a room in which the user contacts the various hardware devices, such as a **head - mounted display (HMD)**, which provide the interface to the

August 20, 2003

virtual environment . The terms "virtual body" and "physical body" should be construed accordingly. One example of a...claw) floating within the virtual 1 5 environment. Other objects may be present in the virtual environment , such as balls 32 and 32', which the user may be intended to catch or throw. The three dimensional movements that the user makes with the control device 18 are replicated by the movements of the virtual manipulator 30 within the virtual environment . The movements of the HMD 10 are also replicated in changes to the location of the viewpoint from which the image of the virtual environment is rendered. The movements are implemented in successive iterations of a simulation loop by the CPU 12. In each iteration, positional changes of the manipulator 30 (and...

...determined from the control 18, positional changes of any of the objects 32 within the virtual environment (whether directly or indirectly the result of user action, or as a result of the complete or partial autonomy of those objects within the confines of the simulation program) are calculated, and a revised image of the virtual environment (also taking account of any changes to the user viewpoint as indicated by signals from HMD 10) is rendered and presented to the user. As this movement will be limited due...

...movement being constrained by the apparatus, a means to enable more extensive movement within the virtual environment may be provided. Such a means is described in our pending unpublished United Kingdom patent...

14/5,K/6 (Item 5 from file: 349)
DIALOG(R)File 349:PCT FULLTEXT
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00409284 **Image available**

VIRTUAL ENVIRONMENT INTERACTION AND NAVIGATION DEVICE
DISPOSITIF D'INTERACTION ET DE NAVIGATION DANS UN ENVIRONNEMENT VIRTUEL

Patent Applicant/Assignee:

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PHILIPS NORDEN AB,

Inventor(s):

GALLERY Richard David,
SHAH Jain Kumar,
HERON Dale Robert,

Patent and Priority Information (Country, Number, Date):

Patent: WO 9750029 A1 19971231

Application: WO 97IB410 19970416 (PCT/WO IB9700410)

Priority Application: GB 9613315 19960625

Designated States: JP AT BE CH DE DK ES FI FR GB GR IE IT LU MC NL PT SE

Main International Patent Class: G06F-003/00

Publication Language: English

Fulltext Availability:

Detailed Description

Claims

Fulltext Word Count: 2575

English Abstract

An apparatus is provided for modelling and interacting with a virtual environment. An image of the environment, and a representation of the

user's presence therein, is generated by a CPU (12) based on data from memories (14, 16) and supplied to the user by a stereoscopic display (10). The user is provided with a hand-held unit (18) which has a single control button (20). When the button (20) is not pressed, the user's movements of the control (18) are replicated by a modelled icon (such as a virtual hand) within the virtual environment to enable interaction. When the button (20) is actuated, the user's movements of control device (18) are instead converted to navigational commands shifting the location of the user's virtual presence around the virtual environment.

French Abstract

L'invention concerne un dispositif servant a modeliser un environnement virtuel et a entrer en interaction avec cet environnement virtuel. Un ordinateur central (12) genere une image de l'environnement, ainsi qu'une representation de la presence de l'utilisateur dans ledit environnement, en fonction de donnees memorisees dans des memoires (14, 16) et transmises a l'utilisateur par un ecran stereoscopique (10). L'utilisateur est pourvu d'une unite (18) qu'il tient a la main et qui possede un seul bouton de commande (20). Quand le bouton (20) n'est pas actionne, les mouvements de l'utilisateur de la commande (18) sont repetes par une icone modelisee (telle qu'une main virtuelle) a l'interieur de l'environnement virtuel, afin de permettre l'interaction. Quand le bouton (20) est actionne, les mouvements de l'utilisateur du dispositif de commande (18) sont, au contraire, convertis en instructions de navigation, ce qui deplace l'emplacement de la presence virtuelle de l'utilisateur autour de l'environnement virtuel.

Fulltext Availability:
Detailed Description

Detailed Description

... mechanistic, form in a computer-generated virtual environment.

1 0 The form taken by the **virtual environment** will depend on the intended use of the system and may, for example, comprise the...

...urban or surreal landscapes for games or other applications, around which environment a virtual body **controlled** by the **user** is **moved**. The form of the virtual body may vary as required by the
1 5 application...

...example a room in which the user contacts the various hardware devices, such as a **head-mounted display (HMD)**, which provide the interface to the **virtual environment**. The terms "virtual body" and "physical body" should be construed accordingly.

One example of a...such an apparatus is illustrated in Figure 1 which shows a plan view comprising a **stereoscopic HMD** unit 10 driven by a CPU 12 to display images of a **virtual environment** from a movable viewpoint. The images of the environment are based on data from an...

...the virtual body within the environment (such as a hand or claw which may be **moved** by the **user** and used to **manipulate** objects within the **virtual environment**) are based on data in a read only memory 16 also coupled with the CPU...

August 20, 2003

00325439 **Image available**

PERSONAL DISPLAY SYSTEM

DISPOSITIF DE VISUALISATION INDIVIDUEL

Patent Applicant/Assignee:

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Patent and Priority Information (Country, Number, Date):

Patent: WO 9607947 A1 19960314
Application: WO 95US11344 19950831 (PCT/WO US9511344)
Priority Application: WO 94US9819 19940831; WO 94US9820 19940831; US
951151 19950714

Designated States: AM AT AU BB BG BR BY CA CH CN CZ DE DK EE ES FI GB GE HU
IS JP KE KG KP KR KZ LK LR LT LU LV MD MG MK MN MW MX NO NZ PL PT RO RU
SD SE SG SI SK TJ TM TT UA UG US UZ VN KE MW SD SZ UG AT BE CH DE DK ES
FR GB GR IE IT LU MC NL PT SE BF BJ CF CG CI CM GA GN ML MR NE SN TD TG

Main International Patent Class: G02B-027/01

International Patent Class: G09G-03:00; H04N-13:00

Publication Language: English

Fulltext Availability:

Detailed Description
Claims

Fulltext Word Count: 22237

English Abstract

A visual display device is provided for delivering a generated image, preferably combinable with environment light, to the eye of a user. In one embodiment an image generator is masked by at least two masks (222, 224) to provide for a high quality image without waste. In one embodiment, a removably mounted shield (302) or activatable device converts the apparatus from a see-through device to an immersion device and back again. A tracker (100) for outputting an indication of the orientation, attitude and/or position of a head-mounted display (HMD) may be provided. The tracker (100) can be configured so that it is incorporated in the HMD housing and/or can be easily decoupled from the HMD, so that the HMD can be used without the tracker (e.g. for watching movies). Preferably, the tracker provides pass-through of signal to the HMD and, when coupled to the HMD, only a single cable (134) connects the HMD-tracker combination to the host computer (510). In one embodiment, the tracker uses magnetic sensors (542a, 542b, 542c). In another embodiment, one or more inertial sensors, such as a rate gyro (52) and/or accelerometers are used (562a, 562b).

French Abstract

Dispositif de visualisation destine a mettre une image projete, de preference une image combinable avec la lumiere du jour, a la portee des yeux d'un utilisateur. Dans un mode de realisation, une visiere (112) protege des reflets et maintient les elements optiques dans l'alignement voulu. Dans un mode de realisation, un diffuseur d'images est pourvu d'au moins deux masques (222, 224) pour pouvoir fournir des images de bonne qualite, sans pertes. Dans un mode de realisation, un pare-lumiere

August 20, 2003

amovible (302) ou un dispositif pouvant etre active permet de faire passer l'appareil du mode transparent au mode immersion et vice versa. Il est possible d'ajouter un dispositif (100) de poursuite destine a fournir des indications sur l'orientation, le mouvement et/ou la position du casque de visualisation frontal (HMD). Le dispositif de poursuite (100) peut se configurer de facon a pouvoir s'integrer a l'armature du HMD et/ou peut facilement se decoupler du HMD de maniere a permettre l'utilisation du HMD sans dispositif de poursuite (par exemple, pour la projection de films). De preference, le dispositif de poursuite transporte le signal destine au HMD et, lorsque le dispositif de poursuite est couple au HMD, la connexion entre le combine HMD-dispositif de poursuite et l'ordinateur central n'est assuree que par un seul cable (134). Dans un mode de realisation, le dispositif de poursuite utilise des capteurs magnetiques (542a, 542b, 542c). Dans une autre mode de realisation, on fait appel a un ou plusieurs capteurs inertiels, tels qu'un gyrometre (52) et/ou des accelerometres (562a, 562b).

Fulltext Availability:
Detailed Description

Detailed Description

... has increased ease of design, fabrication, repair and the like
In many uses of a **head mounted display**, it is desired to collect information regarding the position, posture, orientation, attitude, location and/or **movement** of the **user's** head. This information can be used to **control** the image generated to the eyes of the user for a number of purposes, such...this information can be used to control the characteristics of the image shown in a **head - mounted display** or other virtual reality device, such as to produce changes in the image that would correspond to movement of the user's head. For example, in a flight **simulator** program, when the user's head rotates from a straight ahead position to a 90...

14/5,K/8 (Item 7 from file: 349)

DIALOG(R)File 349:PCT FULLTEXT
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00321207 **Image available**

A GRAPHICAL DISPLAY SYSTEM
SYSTEME DE VISUALISATION GRAPHIQUE

Patent Applicant/Assignee:

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Inventor(s):

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Patent and Priority Information (Country, Number, Date):

Patent: WO 9603715 A1 19960208

Application: WO 95AU445 19950721 (PCT/WO AU9500445)

Priority Application: AU 947013 19940722

Designated States: AM AT AU BB BG BR BY CA CH CN CZ DE DK EE ES FI GB GE HU
IS JP KE KG KP KR KZ LK LR LT LU LV MD MG MN MW MX NO NZ PL PT RO RU SD
SE SG SI SK TJ TM TT UA UG US UZ VN KE MW SD SZ UG AT BE CH DE DK ES FR
GB GR IE IT LU MC NL PT SE BF BJ CF CG CI CM GA GN ML MR NE SN TD TG

Main International Patent Class: G06T-001/60

International Patent Class: G06T-15:00; G06F-12:06

Publication Language: English

Fulltext Availability:

Detailed Description

Claims

Fulltext Word Count: 30900

August 20, 2003

English Abstract

A graphical display system which renders images on surfaces encapsulating a user using a prioritised rendering method. The rendered images for the viewport are accessed using an address recalculation pipeline. The image data is accessed by determining a rotational orientation for the image to be displayed and addressing the stored image data on the basis of the determined rotational orientation. The pixel data is displayed by computing a first vector indicative of a pixel location on the display with respect to a viewpoint for the display, computing a second vector indicative of a spatial orientation of the display, combining said first and second vectors into a resultant vector, determining an intersection point of the resultant vector with a substantially closed notional surface when projected from a fixed interior projection point, and mapping said intersection point onto stored image data so as to address image data for display at said pixel location. The system includes at least one graphic renderer for generating image data corresponding to stored object display information for objects to be displayed by the system, a plurality of display memories for storing image data generated by the at least one renderer, and a selection stage for determining which of the plurality of display memories to store image data for a particular object on the basis of a relative position of that object to the user. The display memories are periodically updated with image data from the renderer, and the period between updates is different between different display memories.

French Abstract

Système de visualisation graphique assurant le rendu d'images sur des surfaces entourant l'utilisateur, par un procédé de rendu à priorités. Le système a accès aux images visualisées destinées à la fenêtre d'observation en utilisant un pipeline de recalcul d'adresse. On a accès aux données d'image en déterminant une orientation de rotation de l'image à afficher et en adressant les données d'image stockées en fonction de l'orientation de rotation déterminée. Afin d'afficher les données relatives aux pixels, on calcule un premier vecteur indiquant l'emplacement d'un pixel sur l'affichage par rapport à un point d'observation de l'affichage, on calcule un deuxième vecteur indiquant une orientation spatiale de l'affichage, on combine lesdits premier et deuxième vecteurs en un vecteur résultant, on détermine un point d'intersection du vecteur résultant avec une surface notionnelle essentiellement fermée lors de sa projection à partir d'un point de projection interne fixe, et on mappe ledit point d'intersection sur les données d'image stockées, de manière à adresser les données d'image pour l'affichage audit emplacement de pixel. Ce système comprend au moins un module de rendu graphique qui génère des données d'image correspondant aux informations d'affichage d'objet stockées relatives aux objets devant être visualisés par le système, un ensemble de mémoires d'affichage qui stockent les données d'image générées par le(s) module(s) de rendu graphique, et un étage de sélection qui détermine laquelle des mémoires d'affichage doit stocker les données d'image relatives à un objet particulier en fonction de la position relative de cet objet par rapport à l'utilisateur. Les mémoires d'affichage sont mises à jour périodiquement avec les données d'image provenant du module de rendu, et la période entre chaque mise à jour est différente d'une mémoire d'affichage à l'autre.

Fulltext Availability:
Detailed Description

Detailed Description

... overlaying
Image overlaying or image composition is a technique often used by low-cost non head - mounted display graphics systems such as video games to increase the apparent realness of a scene. It...frequently changing background objects. Image overlaying generally does not work very well with conventional display controllers in virtual reality

August 20, 2003

systems as **user head rotations** invalidate all display memories including those containing background images. This mass invalidation occurs because all...become invalid when the viewport mapping changes. The only exception to this is when providing **stereoscopy** for large orientation changes. Some re-rendering of close objects may be required for an accurate **stereoscopic** view of the scene

Figure 4 shows a block diagram of a known image generation...

?

August 20, 2003

21/5,K/1 (Item 1 from file: 348)
DIALOG(R) File 348:EUROPEAN PATENTS
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00537294

Image processing unit and method for executing image processing
Verfahren und Einrichtung zur Bildverarbeitung
Methode et dispositif de traitement d'image

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PATENT (CC, No, Kind, Date): EP 502643 A2 920909 (Basic)
EP 502643 A3 930721
EP 502643 B1 960605

APPLICATION (CC, No, Date): EP 92301570 920225;

PRIORITY (CC, No, Date): JP 9139732 910306

DESIGNATED STATES: DE; FR; GB

INTERNATIONAL PATENT CLASS: G09G-005/00

CITED PATENTS (EP A): GB 2201069 A; US 4348186 A

CITED REFERENCES (EP A):

SCIENTIFIC AMERICAN vol. 257, no. 4, October 1987, NEW YORK US pages 82 -
90 J.D. FOLEY 'Interfaces for Advanced Computing';

ABSTRACT EP 502643 A2

An image processing unit generates a virtual environment or an artificial reality by displaying a necessary image in accordance with movement of a view direction of a person on a head mounted display and comprises a sensor (10), an image processing portion (11), and a display (13). The sensor (10) detects a view direction and generates a view vector, and the image processing portion (11) comprises a view direction movement discriminator (14), a priority degree allocator (15), and a partial update portion (16). The view direction movement discriminator (14) calculates a view direction movement vector from the difference between the latest two fetched view vectors, the priority degree allocator (15) generates a projection vector by projecting the view direction movement, determines a priority degree at each divided section of the display screen to be higher when the projection vector approaches and to withdraw from the centre of the display screen to a periphery along the projection vector, and the partial update portion (16) updates the display of the display screen in each divided section in accordance with the priority degree. (see image in original document)

ABSTRACT WORD COUNT: 187

LEGAL STATUS (Type, Pub Date, Kind, Text):

Application: 920909 A2 Published application (A1with Search Report
;A2without Search Report)

Search Report: 930721 A3 Separate publication of the European or
International search report

Examination: 940216 A2 Date of filing of request for examination:
931214

Examination: 950927 A2 Date of despatch of first examination report:
950810

Grant: 960605 B1 Granted patent

Oppn None: 970528 B1 No opposition filed

LANGUAGE (Publication,Procedural,Application): English; English; English

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FULLTEXT AVAILABILITY:

| Available Text | Language | Update | Word Count |
|------------------------------------|-----------|--------|------------|
| CLAIMS A | (English) | EPABF1 | 960 |
| CLAIMS B | (English) | EPAB96 | 930 |
| CLAIMS B | (German) | EPAB96 | 738 |
| CLAIMS B | (French) | EPAB96 | 1042 |
| SPEC A | (English) | EPABF1 | 3121 |
| SPEC B | (English) | EPAB96 | 3146 |
| Total word count - document A | | | 4081 |
| Total word count - document B | | | 5856 |
| Total word count - documents A + B | | | 9937 |

INTERNATIONAL PATENT CLASS: G09G-005/00

...SPECIFICATION of a view direction of a person mounting the same.

In the system generating the **virtual environment** or the artificial reality, regarding the sense of sight, an image processing unit generates the necessary stereo image using a computer graphic technique, the image is displayed on a **head mounted display** mounted on the head of a **user**, and the image is updated in every instant in response to the movement of the...of this invention is explained with reference to the drawings.

In the system generating the **virtual environment** or the artificial reality, regarding a sense of sight, as shown in Fig. 2, an...

...the necessary stereo image using a computer graphic technique, the image is displayed on a **head mounted display** 3 mounted on the head 2 of a **user**, and the image is updated in every instant in response to the movement of the...

...SPECIFICATION of a view direction of a person mounting the same.

In a system generating the **virtual environment** or the artificial reality, regarding the sense of sight, (see for example documents GB-A ...

...the necessary stereo image using a computer graphic technique, the image is displayed on a **head mounted display** mounted on the head of a **user**, and the image is updated every instant in response to the movement of the properly...of this invention is explained with reference to the drawings.

In the system generating the **virtual environment** or the artificial reality, regarding a sense of sight, as shown in Fig. 2, an...

...the necessary stereo image using a computer graphic technique, the image is displayed on a **head mounted display** 3 mounted on the head 2 of a **user**, and the image is updated in every instant in response to the movement of the...

21/5,K/2 (Item 1 from file: 349)

DIALOG(R)File 349:PCT FULLTEXT

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00971739 **Image available**

VTV SYSTEM

SYSTEME VTV

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Legal Representative:

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Patent and Priority Information (Country, Number, Date):

Patent: WO 200301803 A1 20030103 (WO 0301803)

Application: WO 2001US49287 20011221 (PCT/WO US0149287)

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Priority Application: US 2001891733 20010625

Designated States: AE AG AL AM AT AU AZ BA BB BG BR BY BZ CA CH CN CO CR CU
CZ DE DK DM DZ EC EE ES FI GB GD GE GH GM HR HU ID IL IN IS JP KE KG KP
KR KZ LC LK LR LS LT LU LV MA MD MG MK MN MW MX MZ NO NZ PL PT RO RU SD
SE SG SI SK SL TJ TM TR TT TZ UA UG US UZ VN YU ZA ZW
(EP) AT BE CH CY DE DK ES FI FR GB GR IE IT LU MC NL PT SE TR
(OA) BF BJ CF CG CI CM GA GN GQ GW ML MR NE SN TD TG
(AP) GH GM KE LS MW MZ SD SL SZ TZ UG ZM ZW
(EA) AM AZ BY KG KZ MD RU TJ TM

Main International Patent Class: H04N-007/00

International Patent Class: H04N-009/43; H04N-009/64; G09G-005/00 ;

G02B-027/22; G02B-005/08; G02B-005/20

Publication Language: English

Filing Language: English

Fulltext Availability:

Detailed Description

Claims

Fulltext Word Count: 15372

English Abstract

An overall hardware configuration that produces an enhanced spatial television-like viewing experience is disclosed (Fig. 1). Unlike normal television, with this system the viewer is able to control (remote control) both the viewing direction and relative position of the viewer with respect to the movie action (Fig. 6). In addition to a specific hardware configuration (S0, S1, S2, S3), this patent also relates to a new video format which makes possible this virtual reality like experience (Wireless HMD).

French Abstract

L'invention concerne une configuration materielle globale, qui cree une forme amelioree de visualisation spatiale, similaire a la television. Contrairement a la television classique, ce systeme permet au telespectateur de commander (telecommander) la direction de visualisation et la position relative du telespectateur par rapport a l'action du film (fig. 6). Outre cette configuration materielle specifique (S0, S1, S2, S3), la presente invention porte egalement sur un nouveau format video qui permet de realiser cette experience virtuelle proche de la realite (HMD sans fil).

Legal Status (Type, Date, Text)

Publication 20030103 A1 With international search report.

Publication 20030103 A1 With amended claims.

Examination 20030515 Request for preliminary examination prior to end of
19th month from priority date

...International Patent Class: G09G-005/00

Fulltext Availability:

Claims

Claim

... such that the horizontal direction of view within the 360 degree by X degree vertically " **virtual environment** " is dynamically controllable by the **user** at runtime (while the images being displayed). 28) An electronic device as described in claims...

...azimuth and elevation of the viewport within the 360 degree horizontal by X degree vertical " **virtual environment** " is dynamically controllable by the **user** at runtime (while the images being displayed). 29) An electronic device as described in claims...described in claims I I- 16, 26-29, in which the virtual camera position within **virtual environment** " (i.e. the viewpoint of the viewer) is dynamically controllable by the **user** at runtime (while the images are being displayed). 31) An electronic device as described in...which is controlled by the direction of the viewport within the 360 degree Image

Sphere (" virtual environment "). 34) An electronic device as described in claims 11 - 16, 26-31, in...direction of the viewport within the 360 degree Image Sphere and virtual position within the " virtual environment ". 35) An electronic device as described in claims 11 - 16, 26-34, which...41, which converts the three-dimensional objects into a universal graphics description language" such as VRML or other appropriate language for storage or live

C" t, C@

transmission and subsequent decoding...composite image" before displaying on the output device (such as a flat screen display or HMD). 47) An electronic device as described in claims 43-45, which displays imagery as described...composite image" before displaying on the output device (such as a flat screen display or HMD). 48) An electronic device as described in claims 47, which in addition to using the...movement in the azimuth of the camera (of the viewer in the case of an HMD based camera assembly) as shown in figs. 16,19 and more completely described in paragraphs viewer in the case of an HMD based camera assembly) as shown in figs. 26,28 and more completely described in paragraphs...

...movement in the roll of the camera (of the viewer in the case of an HMD based camera assembly) as

shown in figs. 26,29 and more completely described in paragraphs...the physical (spatial) position of the camera (of the viewer in the case of an HMD based camera assembly) in either or any combination of the X, Y or Z axes...controllable on-axis light sources which are synchronized to the video capture rate of the HMD based or remote panoramic cameras to improve the ability of the system to correctly identify...controllable on-axis light sources which are synchronized to the video capture rate of the HMD based or remote panoramic cameras to improve the ability of the system to correctly identify HMD based or remote panoramic cameras to improve the ability of the system to correctly identify...

...optical beacons" (controllable light sources which are synchronized to the video capture rate of the HMD based or remote panoramic cameras) such that pulse timing, color of light and/or combinations of these are used to transmit the "real world" coordinates of the beacon to the HMD or remote panoramic camera to determine absolute angular/spatial references for ...a number of "bi-directional infrared beacons" which communicate a unique ID code between the HMD and the beacon such that this calibration) An electronic device which utilizes a single optical... as described in claims 11 - 17, in which the -viewpoint within the 3D " virtual environment " (i.e. the viewpoint of the viewer within a 3D virtual space that contains the objects that comprise the image) is dynamically controllable by the user at runtime (while the images are being displayed). 32) An electronic device as described in claims 11-17, in which the viewpoint within the 3D " virtual environment " (i.e. the viewpoint of the viewer within a 3D virtual space that contains the...of the viewport within the panorama and virtual position of the viewpoint within the 3D " virtual environment ". 36) An electronic device as described in claims 11-17 which is capable of combining...which converts the three-dimensional objects into a 44 universal graphics description language" such as VRML or other appropriate language for storage or live transmission and subsequent decoding into graphical imagery... composite image" before displaying on the output device (such as a flat screen display or HMD). 47) An electronic device which incorporates a combination of Frequency Compression and Expanding (Companding) in... movement in the azimuth of the camera (of the viewer in the case of an HMD based camera assembly) as shown in figs. 16, 17, 23 and more completely described in the camera (of the viewer in the case of an HMD based camera assembly) as shown in figs. 16, 18@ 23 and more completely described in...

...movement in the roll of the camera (of the viewer in the case of an HMD based camera assembly) as shown in figs. 16, 19, 23 and more completely described in...the physical (spatial) position of the camera (of the viewer in the case of an HMD based camera assembly) in either or any

August 20, 2003

combination of the X, Y or Z axes...controllable on-axis fight sources which are synchronized to the video capture rate of the HMD based or remote panoramic cameras to improve the ability of the system to correctly identify...controllable on-axis light sources which are synchronized to the video capture rate of the HMD based or remote panoramic cameras to improve the ability of the system to correctly identify rate of the HMD based or remote panoramic cameras to improve the ability of the system to correctly identify...

...optical beacons" (controllable fight sources which are synchronized to the video capture rate of the HMD based or remote panoramic cameras) such that pulse timing, color of light and/or combinations...

21/5,K/3 (Item 2 from file: 349)
DIALOG(R)File 349:PCT FULLTEXT
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00930267

METHOD AND SYSTEM TO PRESENT IMMERSION VIRTUAL SIMULATIONS USING
THREE-DIMENSIONAL MEASUREMENT
PROCEDE ET SYSTEME DE PRESENTATION PAR IMMERSION DE SIMULATIONS VIRTUELLES
PAR IMMERSION, UTILISANT DES MESURES EN 3D

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Patent and Priority Information (Country, Number, Date):

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Application: WO 2002US3433 20020205 (PCT/WO US0203433)
Priority Application: US 2001777778 20010205

Designated States: AE AG AL AM AT AU AZ BA BB BG BR BY BZ CA CH CN CO CR CU

CZ DE DK DM DZ EC EE ES FI GB GD GE GH GM HR HU ID IL IN IS JP KE KG KP
KR KZ LC LK LR LS LT LU LV MA MD MG MK MN MW MX MZ NO NZ OM PH PL PT RO
RU SD SE SG SI SK SL TJ TM TR TT TZ UA UG UZ VN YU ZA ZM ZW

(EP) AT BE CH CY DE DK ES FI FR GB GR IE IT LU MC NL PT SE TR

(OA) BF BJ CF CG CI CM GA GN GQ GW ML MR NE SN TD TG

(AP) GH GM KE LS MW MZ SD SL SZ TZ UG ZM ZW

(EA) AM AZ BY KG KZ MD RU TJ TM

Main International Patent Class: G09G-005/00

International Patent Class: G09G-005/08; G03B-021/00

Publication Language: English

Filing Language: English

Fulltext Availability:

Detailed Description

Claims

Fulltext Word Count: 7663

English Abstract

A virtual simulation system generates an image of a virtual control on a display that may be a heads-up-display in a vehicle. The system uses three-dimensional range finding data to determine when a user is sufficiently close to the virtual control to "manipulate" the virtual control. The user "manipulation" is sensed non-haptically by the system, which causes the displayed control image to move in response to user manipulation. System output is coupled, linearly or otherwise, to an actual device having a parameter that is adjusted substantially in

August 20, 2003

real-time by user-manipulation of the virtual image. System generated displays can be dynamic and change appearance when a user's hand is in close proximity displays can disappear until needed, or can include menus and icons to be selected by the user who points towards or touches the virtual images. System generate images can include representation of the user for use in a training or gaming system.

French Abstract

L'invention porte sur un systeme virtuel de simulation elaborant l'image d'une commande virtuelle sur un ecran pouvant etre le dispositif tete haute d'un vehicule. Ledit systeme utilise des donnees de telemetrie en 3D pour determiner quand l'utilisateur est suffisamment rapproche de la commande virtuelle pour pouvoir la "manipuler". Les "manipulation" de l'utilisateur sont detectees non haptiquement par le systeme, ce qui provoque le deplacement des images de commande en reponse a ladite manipulation. Les signaux de sortie du systeme sont couples, lineairement ou autrement, a un dispositif reel presentant un parametre s'ajustant sensiblement en temps reel lors de la manipulation de l'image virtuelle par l'utilisateur. Les images produites par le systeme peuvent etre dynamiques et changer d'apparence lorsque l'une des mains de l'utilisateur se trouve a proximite immediate. Les images peuvent disparaitre jusqu'a ce qu'un les utilise, ou peuvent comprendre des menus et des icones selectionnables par l'utilisateur en pointant sur une image virtuelle ou en la touchant. Les images produites par le systeme peuvent comprendre une representation de l'utilisateur utilisable dans des systeme de jeu ou d'entrainement.

Legal Status (Type, Date, Text)

Publication 20020815 A1 With international search report.

Publication 20020815 A1 Before the expiration of the time limit for amending the claims and to be republished in the event of the receipt of amendments.

Examination 20030213 Request for preliminary examination prior to end of 19th month from priority date

Main International Patent Class: G09G-005/00

Fulltext Availability:

Detailed Description

Detailed Description

... add to the cost of a computer simulated system, and can be cumbersome to the user . Not only is freedom of 1 5 motion restricted by such sensor-implemented devices, but...

...sized gloves for adults, medium-sized gloves, small-sized gloves, etc. Further, only the one user

wearing the body suit, glove, helmet, goggles can utilize the virtual system; onlookers for example see essentially nothing. An onlooker not wearing such sensor-laden garments cannot participate in the virtual world being presented and cannot manipulate virtual objects.

U.S. patent no. 5,168,531 to...

21/5,K/4 (Item 3 from file: 349)

DIALOG(R) File 349:PCT FULLTEXT

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00833851 **Image available**

VEHICLE SIMULATOR HAVING HEAD-UP DISPLAY

SIMULATEUR DE VEHICULE A SYSTEME DE VISION TETE HAUTE

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US (Residence), US (Nationality), (For all designated states except:

August 20, 2003

US)

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Patent and Priority Information (Country, Number, Date):

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Application: WO 2001US6226 20010227 (PCT/WO US0106226)
Priority Application: US 2000519957 20000307

Parent Application/Grant:

Related by Continuation to: US 2000519957 20000307 (CON)

Designated States: AE AG AL AM AT AU AZ BA BB BG BR BY BZ CA CH CN CR CU CZ

DE DK DM DZ EE ES FI GB GD GE GH GM HR HU ID IL IN IS JP KE KG KP KR KZ
LC LK LR LS LT LU LV MA MD MG MK MN MW MX MZ NO NZ PL PT RO RU SD SE SG
SI SK SL TJ TM TR TT TZ UA UG US UZ VN YU ZA ZW
(EP) AT BE CH CY DE DK ES FI FR GB GR IE IT LU MC NL PT SE TR
(OA) BF BJ CF CG CI CM GA GN GW ML MR NE SN TD TG
(AP) GH GM KE LS MW MZ SD SL SZ TZ UG ZW
(EA) AM AZ BY KG KZ MD RU TJ TM

Main International Patent Class: G09G-005/00

Publication Language: English

Filing Language: English

Fulltext Availability:

Detailed Description

Claims

Fulltext Word Count: 4889

English Abstract

A vehicle simulator (40) having a projection system (42) for projecting a generated scene (44) and symbology (46) onto a common viewing screen (48). Tracking apparatus (50) is provided for providing position and/or angular orientation signals representative of the eye (19) of a person viewing the projected scene and symbology. An image generation system is included for generating the scene and symbology for the projection system, such scene and symbology being generated as a function of the position and/or angular orientation signals provided by the tracking apparatus. Such symbology is representative of symbology produced by a head-up display.

French Abstract

La presente invention concerne un simulateur de vehicule equipe d'un systeme de projection concu pour projeter une scene et la symbologie generee sur un ecran de visionnage commun. Un appareil de poursuite permet de fournir des signaux de position et/ou d'orientation angulaire caracteristiques de l'oeil d'une personne visionnant la scene projete et sa symbologie. Un systeme de generation d'image permet de generer la scene et la symbologie destinees au systeme de projection, ces scenes et symbologie etant generees en fonction des signaux de position et/ou d'orientation angulaire fournis par l'appareil de poursuite. Une telle symbologie est representative de la symbologie produite par un systeme de vision tete haute. Le systeme de generation d'image genere la scene et la symbologie avec des caracteristiques qui simulent les effets de vignettage et d'occultation caracteristiques de la vision tete haute. La scene par la fenetre et la symbologie sont projetees sur un ecran et co-localisees alors que le generateur d'image, la base ou la position de l'oeil de l'utilisateur produisent la symbologie de facon a simuler les effets de collimation, de vignettage et d'occultation du type optique de vision tete haute utilise dans le vehicule qui est simule.

Legal Status (Type, Date, Text)

Publication 20010913 A2 Without international search report and to be

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republished upon receipt of that report.
Examination 20011220 Request for preliminary examination prior to end of
19th month from priority date
Search Rpt 20020704 Late publication of international search report
Republication 20020704 A3 With international search report.

Main International Patent Class: G09G-005/00

Fulltext Availability:

Detailed Description

Detailed Description

... arrow 46) onto a common viewing screen 48. Other methods of presenting images to the user may also be used, including a CRT display, an LCD display, various shaped screens with varying surfaces, viewed directly or through optical systems, or helmet-mounted displays. Tracking apparatus 50 is provided to give position and/or angular orientation signals...
...position of the eye 19 of a person, here a pilot being trained in the simulator 10, and viewing the projected scene 44 and the symbology 46 on screen 48...

21/5,K/5 (Item 4 from file: 349)
DIALOG(R)File 349:PCT FULLTEXT
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00822361 **Image available**

SELF-REFERENCED TRACKING

POURSUITE A AUTO-REFERENCE

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Legal Representative:

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Patent and Priority Information (Country, Number, Date):

Patent: WO 200156007 A1 20010802 (WO 0156007)
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Priority Application: US 2000178797 20000128

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DE DK DM DZ EE ES FI GB GD GE GH GM HR HU ID IL IN IS JP KE KG KP KR KZ

LC LK LR LS LT LU LV MA MD MG MK MN MW MX MZ NO NZ PL PT RO RU SD SE SG

SI SK SL TJ TM TR TT UA UG US UZ VN YU ZA ZW

(EP) AT BE CH CY DE DK ES FI FR GB GR IE IT LU MC NL PT SE TR

(OA) BF BJ CF CG CI CM GA GN GW ML MR NE SN TD TG

(AP) GH GM KE LS MW MZ SD SL SZ TZ UG ZW

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Main International Patent Class: G09G-005/00

Publication Language: English

Filing Language: English

Fulltext Availability:

Detailed Description

Claims

Fulltext Word Count: 10381

English Abstract

A new tracking technique is essentially "sourceless" (30) in that it can be used anywhere with no set-up, yet it enables a much wider range of virtual environment-style navigation and interaction techniques than does a simple head-orientation track. A sourceless head orientation tracker (30) is combined with a head-worn tracking device (12) that tracks a

August 20, 2003

hand-mounted 3D beacon (14) relative to the head (16). The system encourages use of intuitive interaction techniques which exploit proprioception.

French Abstract

La nouvelle technique de poursuite de l'invention est sensiblement <= sans source >= (30) en ce qu'elle peut etre utilisee sans initialisation et qu'elle permet quand-meme l'utilisation d'une plage sensiblement plus grande de techniques de navigation dans un environnement virtuel et d'interaction qu'avec une simple poursuite de l'orientation de la tete. Un systeme de poursuite de l'orientation de la tete (30) sans source est combine a un dispositif de poursuite (120) porte sur la tete, qui poursuit une balise 3D (14) montee sur la main, par rapport a la tete (16). Ledit systeme favorise l'utilisation de techniques d'interaction intuitives exploitant la proprioception.

Legal Status (Type, Date, Text)

Publication 20010802 A1 With international search report.

Correction 20020124 Corrected version of Pamphlet front pages: revised abstract received by the International Bureau after completion of the technical preparations for international publication

Republication 20020124 A1 With international search report.

Main International Patent Class: G09G-005/00

Fulltext Availability:

Detailed Description

Detailed Description

... representative of the motion of the hand relative to tile head.

Figure 5 illustrates a user wearing a portable VR tennis game or training system. The computer and batteries are contained in backpack 502, which is cabled to HMD 500 to which - 18 are mounted inertial sensors 506 and ultrasonic transducers 510. He...

21/5,K/6 (Item 5 from file: 349)

DIALOG(R) File 349: PCT FULLTEXT

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00783376 **Image available**

3D NAVIGATION SYSTEM USING COMPLEMENTARY HEAD-MOUNTED AND STATIONARY INFRARED BEAM DETECTION UNITS

SYSTEME DE NAVIGATION TRIDIMENSIONNEL UTILISANT DES BLOCS DE DETECTION DE FAISCEAUX INFRAROUGES COMPLEMENTAIRES FIXES ET DE VISUALISATION

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Patent and Priority Information (Country, Number, Date):

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Application: WO 2000US23517 20000824 (PCT/WO US0023517)

Priority Application: US 99151091 19990827; US 99164812 19991110; US 2000648192 20000823

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DM EE ES FI GB GD GE GH GM HR HU ID IL IN IS JP KE KG KP KR KZ LC LK LR

LS LT LU LV MA MD MG MK MN MW MX NO NZ PL PT RO RU SD SE SG SI SK SL TJ

TM TR TT TZ UA UG UZ VN YU ZA ZW

(EP) AT BE CH CY DE DK ES FI FR GB GR IE IT LU MC NL PT SE

(OA) BF BJ CF CG CI CM GA GN GW ML MR NE SN TD TG

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Main International Patent Class: G09G-005/00

Publication Language: English

Filing Language: English

Fulltext Availability:

Detailed Description

Claims

Fulltext Word Count: 14008

English Abstract

A 3D navigation system employs a complementary pair of emitter/detector units, one (10) worn on a part of a user's body (e.g., the head) and the other (20) mounted in a stationary position on a display monitor facing the user. Each unit has an array of photovoltaic (PV) cells (10b, 20b) centered on a normal axis and an infrared diode (10a, 20a) for emitting a light beam on the normal axis. Each photodetectors array receives the infrared beam from the other unit and provides output signals representing the light intensities of the received beam on the PV cells. The PV cell response signals of the complementary units are used together to calculate the position and angular orientation of the user-worn unit relative to the stationary unit. The position and angle values are used by a software device driver installed on a computer to control 3D navigation functions of the associated application program on the computer. The system can be used for playing interactive 3D games, and also used for hands-free control in a wide range of other applications and environments, such as to control flight motions in a simulator or cockpit of an aircraft, or the command center of a naval vessel, spaceship, land vehicle, etc. for disabled persons to provide hands-free input to a computer, motorized wheelchair, prosthetic device etc., and for controlling various functions in an industrial environment, such as guiding machine-assisted movement, or in CAD design, architectural, medical graphics, virtual reality, and other applications.

French Abstract

Un systeme de navigation tridimensionnelle utilise deux blocs complementaires detecteur/emetteur, l'un (10) se situant sur une partie du corps d'un utilisateur (par ex., la tete) et l'autre (20) etant fixe dans une position fixe sur un moniteur d'affichage face a l'utilisateur. Chaque bloc comprend un reseau de cellules photovoltaiques (PV) (10b, 20b) centrees sur un axe perpendiculaire et une diode infrarouge (10a, 20a) servant a emettre un faisceau de lumiere sur ledit axe. Chaque reseau de photodetecteurs recoit le faisceau a partir de l'autre bloc et produit des signaux de sortie representant les intensites de lumiere du faisceau recu sur les cellules PV. Les signaux de reponse des cellules PV des blocs complementaires sont utilises pour calculer la position et l'orientation angulaire du bloc non porte par l'utilisateur par rapport au bloc fixe. Les valeurs d'angle et de position sont utilisees par un pilote de dispositif de logiciel installe sur un ordinateur afin de commander des fonctions de navigation tridimensionnelles du programme d'application associe. On peut utiliser ledit systeme pour jouer a des jeux interactifs tridimensionnels, et dans le cadre de commande mains libres d'une large variete d'autres applications et d'environnements, tels que la commande des mouvements de vols dans un simulateur de vol ou un cockpit d'avion, ou le centre de commande d'un navire, d'un vaisseau spatial, d'un vehicule terrestre, etc. Ce systeme peut egalement etre utilise par des personnes handicapees de maniere a leur fournir une entree mains libres a un ordinateur, avec une chaise roulante motorisee, un dispositif prothetique etc., et dans un environnement industriel pour commander diverses fonctions, telles que le guidage de mouvements assistes par machine, ou dans un modele CAAO, avec des graphiques medicaux et architecturaux, en realite virtuelle et dans d'autres applications.

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Publication 20010308 A1 With international search report.
Publication 20010308 A1 Before the expiration of the time limit for
amending the claims and to be republished in the
event of the receipt of amendments.
Examination 20010712 Request for preliminary examination prior to end of
19th month from priority date

Main International Patent Class: G09G-005/00

Fulltext Availability:
Detailed Description

Detailed Description

... besides games. It may be used to control flight motions and display views in a **simulator** or cockpit of an aircraft, or the command center of a naval vessel, spaceship, land vehicle, etc. Leaving the **user**'s hands free allows for simultaneous control of other functions, such as manipulation of controls...

...for example, guiding the machine-assisted movement and orientation of a workpiece while leaving the **operator**'s hands free to manipulate process equipment applied to the workpiece (welding, painting, laminating, etc...

...design, architectural, medical graphics, virtual reality, and other commercial applications. For example, use of the **headset** with a virtual reality display can allow a 3D "tour" to be taken through construction sites, buildings, medical diagnostic images, and simulated or **artificial environments**.

Other objects, features, and advantages of the present invention will be described in further detail...the average value.

In FIG. 61 a screen-shot of the interface for a software **simulation** program is shown for modeling the solution inputs of the device. A **user** can vary the angles and location of the **headset** unit. The cells are identified in the left-hand column as H1-H4 for the **headset** unit, and M1-M4 for the monitor unit. The cell numbering proceeds from the top...3D "tour" to be taken moving through 3D constructions, buildings, medical images, and simulated or **artificial environments**, with lifelike angle shifts of the **user**'s head simulating corresponding changes in view.

The movable unit could also be mounted on...

21/5,K/7 (Item 6 from file: 349)
DIALOG(R) File 349:PCT FULLTEXT
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00554475 **Image available**

INTUITIVE CONTROL OF PORTABLE DATA DISPLAYS
COMMANDE INTUITIVE D'UN ECRAN PORTABLE DE PRESENTATION DE DONNEES
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Inventor(s):

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FATEH Sina,
FLACK James,

Patent and Priority Information (Country, Number, Date):

Patent: WO 200017848 A1 20000330 (WO 0017848)

Application: WO 99US21235 19990922 (PCT/WO US9921235)

Priority Application: US 98101433 19980922; US 99404051 19990922

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Main International Patent Class: G09G-005/00

International Patent Class: G09G-005/08; G09G-005/26; G09G-005/34

Publication Language: English

Fulltext Availability:

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Detailed Description

Claims

Fulltext Word Count: 13625

English Abstract

A virtual computer monitor is described which enables instantaneous and intuitive visual access to large amounts of visual data by providing the user with a large display (20) projected virtually in front of the user. The user wears a head-mounted display (26) or holds a portable display containing a head-tracker (28) or other motion tracker, which together allow the user to position an instantaneous viewport (22) provided by the display at any position within the large virtual display (20) by turning to look in the desired direction. The instantaneous viewport (22) further includes a mouse pointer, which may be positioned by turning the user's head or moving the portable display, and which may be further positioned using a mouse or analogous control device. A particular advantage of the virtual computer monitor is intuitive access to enlarged computer output for visually-impaired individuals.

French Abstract

L'invention porte sur un ecran virtuel d'ordinateur permettant un acces visuel instantane et intuitif a une grande quantite de donnees visuelles presentees a l'utilisateur sur un grand ecran (20) virtuel dispose face a lui. L'utilisateur utilise a cet effet un visiocasque (26) ou un afficheur portable lie a un casque-ecran (28) ou un suiveur de mouvement, qui conjointement permettent a l'utilisateur de selectionner un secteur visuel instantane (22) correspondant a l'une des positions du grand ecran virtuel (20) en tournant la tete pour fixer la direction desiree. Le secteur visuel instantane (22) comporte en outre un curseur de souris pouvant se positionner par une rotation de la tete ou un deplacement de l'afficheur portable, ou a l'aide d'une souris ou d'un dispositif de commande analogue. L'un des avantages particuliers de l'ecran virtuel d'ordinateur reside dans la possibilite donnee a des malvoyants d'acceder intuitivement a d'importantes quantites de donnees fournies par un ordinateur.

Main International Patent Class: G09G-005/00

Fulltext Availability:

Detailed Description

Detailed Description

... simulated objects in the environment using a control peripheral.

In a virtual reality system, the **user** is "immersed" in a synthetic environment, in which virtual objects can be located anywhere in the **user**'s physical space. The **user** views these objects by wearing a **head-mounted display (HMD)**, which uses an optical system to cause a tiny display source such as a cathode...

...crystal display to appear as a large display screen several feet in front of the **user**. Since the display source (or sources in the case of two eyes) is fixed to the **user**'s head, the display is viewable regardless of where the **user** points his line-of-sight. The **user** also wears a **head-tracker**, which senses the direction the **user** is facing, and sends this information to the host computer. The computer uses this data to generate graphics corresponding to the **user**'s line of sight in the **virtual environment**. This approach to human/computer interfaces was first conceived by Ivan Sutherland in 1966 for use in military simulators, and was first commercialized in the form of the **EyePhone head-mounted display** by VPL Research in the late 1980s, Prior art in this area includes a wide...

...patents describing low-vision aids, improved virtual reality systems and components such as HMDs and **head-trackers**, but none which embody or

August 20, 2003

anticipate the present invention.

In the field of low-vision...HMD imagery can be implemented analogously for viewing arbitrary computer data instead of specially-constructed **virtual environments**. For normally sighted individuals, this could be beneficial by providing a large virtual computer desktop surrounding the **user**, which can provide simultaneous access to a larger amount of visual data than is possible...

...currently provided on common computing platforms such as Macintosh and Windows. For visually-impaired individuals, **head - tracked HMD** display techniques can be used to conveniently access a magnified virtual page, and thus enable...of the image.

An additional important feature resides in the use of a partially immersive **HMD**, which avoids **simulation** sickness by allowing the **user** to maintain a constant frame of reference in the physical world since real objects can...

21/5,K/8 (Item 7 from file: 349)
DIALOG(R)File 349:PCT FULLTEXT
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00543702 **Image available**
**PROJECTION SCREEN BASED ON RECONFIGURABLE HOLOGRAPHIC OPTICS FOR
IMPLEMENTATION IN HEAD-MOUNTED DISPLAYS**
**ECRAN DE PROJECTION BASE SUR UNE OPTIQUE HOLOGRAPHIQUE RECONFIGURABLE ET
DESTINE A EQUIPER DES VISIOCASQUES**

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WALDERN Jonathan D,

Inventor(s):

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Patent and Priority Information (Country, Number, Date):

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Priority Application: US 9894496 19980729; US 99361778 19990726

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ES FI GB GD GE GH GM HR HU ID IL IN IS JP KE KG KP KR KZ LC LK LR LS LT
LU LV MD MG MK MN MW MX NO NZ PL PT RO RU SD SE SG SI SK SL TJ TM TR TT
UA UG US UZ VN YU ZW GH GM KE LS MW SD SL SZ UG ZW AM AZ BY KG KZ MD RU
TJ TM AT BE CH CY DE DK ES FI FR GB GR IE IT LU MC NL PT SE BF BJ CF CG
CI CM GA GN GW ML MR NE SN TD TG

Main International Patent Class: G03H-001/00

International Patent Class: G09G-005/00

Publication Language: English

Fulltext Availability:

Detailed Description
Claims

Fulltext Word Count: 7942

English Abstract

A head-mounted display system (10) and a method of displaying scenes within the system include two or more reconfigurable holographic optical elements (HOEs) (44, 46 and 48) in a holographic diffuser (22; 62) of the system. The reconfigurable HOEs may be configured to perform simple optical functions that are commonly associated with traditional optical devices, such as lenses, prisms and mirrors. However, the reconfigurable HOEs may also be configured to perform sophisticated optical manipulations, such as optimally diffusing light with respect to intensity toward a predefined direction. Each reconfigurable HOE includes a hologram (50, 52 and 54) that is sandwiched between two electrode

layers (56). The hologram is a holographic photopolymeric film that has been combined with liquid crystal. The hologram has an optical property that changes in response to an applied electrical field. Stacks (28 and 30; 64, 66, 68 and 70) of these reconfigurable HOE are utilized to selectively diffuse monochromatic images projected from an image generator (18) to either the right or the left eyepiece optics (24 and 26) of the system to present a displayed virtual scene in either a stereoscopic form or a binocular mono form. By utilizing more than one reconfigurable HOE stack for each projected image, the size of effective exit pupils at the eyepiece optics may be increased.

French Abstract

On decrit un dispositif de visiocasque (10) et un procede de presentation de scenes a l'interieur dudit dispositif. Le dispositif de visiocasque inclut un ou plusieurs elements optiques holographiques reconfigurables (HOE) (44, 46, 48) places dans une bonnette diffusante holographique (22; 62) du dispositif. Les HOE reconfigurables peuvent etre configures pour remplir de simples fonctions optiques generalement associees a des dispositifs optiques traditionnels, tels que des lentilles, des prismes ou des miroirs. Toutefois, les HOE reconfigurables peuvent egalement etre configures pour des manipulations optiques sophistiquees, telles qu'une diffusion optimale de la lumiere par rapport a l'intensite dans une direction predefinie. Chaque HOE reconfigurable inclut un hologramme (50, 52, 54) place en sandwich entre deux couches d'electrodes (56). Cet hologramme est constitue d'un film photopolymere holographique associe a des cristaux liquides. L'hologramme presente des proprietes optiques qui changent en reponse a l'application d'un champ electrique. Des etages (28, 30; 64, 66, 68, 70) desdits HOE reconfigurables sont mis en oeuvre pour diffuser selectivement des images monochromes projetees d'un generateur d'image (18), soit vers l'oculaire droit soit vers l'oculaire gauche (24, 26) du dispositif, pour presenter une scene virtuelle en stereoscopie ou sous forme binoculaire monochrome. En utilisant plusieurs etages d'HOE reconfigurables pour chaque image projete, on peut augmenter la taille de la pupille de sortie effective aux oculaires.

International Patent Class: G09G-005/00

Fulltext Availability:

Detailed Description

Detailed Description

... display system that utilizes a single image source.

DESCRIPTION OF THE RELATED ART

1 5 **Head - mounted display** systems generally rely on two image sources to visually present right and left images of scenes to the right and left eyes of a **user**. Typically, the first image source generates an image of a scene that is to be viewed by the right eye of the **user**, while the second image source generates an image of the scene that is to be viewed by the left eye of the **user**. A **head - mounted display** system may be designed to display scenes in a binocular mono form or in a **stereoscopic** form. In a binocular mono **head - mounted display** system, the images that are to be viewed by the right and left eyes of the **user** are the same perspective images of a scene.

When these same perspective images are simultaneously...

...observes a binocular mono scene produced by the right and left images. In a stereoscopic **head - mounted display** system, the images that are to be viewed by the right and left eyes of the **user** are two slightly different perspective images of the same scene. When these slightly different perspective images are simultaneously viewed, the **user** observes a **stereoscopic** scene produced by the right and left perspective images.

August 20, 2003

In contrast to the head-mounted...from the holographic diffuser. The virtual scene can be viewed by the user of the **head - mounted display** system through the right and left eyepiece optics. Depending on the right and left images that are projected, the virtual scene may be in a **stereoscopic** form or in a binocular mono form.

In a modified configuration of the head-mounted...

...image source, i.e., the image generator, is required to display scenes either in a **stereoscopic** form or in a binocular mono form. Furthermore, the exit pupils at the eyepiece optics of the system may be selectively displaced to coincide with the pupils of the **user**'s eyes. In addition, the size of effective exit pupils at the eyepiece optics may...

...projected images to minimize loss of both brightness and field of view perceived by the **user**.

BRIEF DESCRIPTION OF THE DRAWINGS

Fig. 1 is a schematic perspective view of a head...

21/5,K/9 (Item 8 from file: 349)
DIALOG(R)File 349:PCT FULLTEXT
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00538814 **Image available**

STEREOSCOPIC USER INTERFACE METHOD AND APPARATUS INTERFACE UTILISATEUR STEREOSCOPIQUE: PROCEDE ET APPAREIL

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Inventor(s):

DeLUCA Michael J,

Patent and Priority Information (Country, Number, Date):

Patent: WO 200002187 A1 20000113 (WO 0002187)

Application: WO 99US14546 19990628 (PCT/WO US9914546)

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DK EE ES FI GB GE GH GM HU ID IL IS JP KE KG KP KR KZ LC LK LR

LS LT LU LV MD MG MN MW MX NO NZ PL PT RO RU SD SE SG SI SK SL TJ

TM TR TT UA UG US UZ VN YU ZW GH GM KE LS MW SD SL SZ UG ZW AM AZ BY KG

KZ MD RU TJ TM AT BE CH CY DE DK ES FI FR GB GR IE IT LU MC NL PT SE BF

BJ CF CG CI CM GA GN GW ML MR NE SN TD TG

Main International Patent Class: G09G-005/00

International Patent Class: H04N-007/18; G06K-009/46

Publication Language: English

Fulltext Availability:

Detailed Description

Claims

Fulltext Word Count: 4572

English Abstract

A computer system (200-322) stereoscopically projects a three dimensional object (245) having an interface image (250) in a space observable by a user (100). The user controls the movement of a physical object (400) within the space while observing both the three dimensionally projected object and the physical object. The computer system monitors the position of the user to determine the position of the interface image within the space and further monitors the movement of the physical object to determine its position. A control signal is generated in response to the position of the physical object intersecting the position of the interface image. For example, a word processing program is indicated by an interface image such as an icon including the letter "W" three dimensionally projected within the space. The word processing is activated when the user's finger moves within the space to touch the projected icon.

August 20, 2003

French Abstract

L'invention concerne un systeme informatique (200-322) projetant en mode stereoscopique l'image d'un objet tridimensionnel (245) dont l'image (250) d'interface se trouve dans un espace qu'un utilisateur (100) peut observer. L'utilisateur commande le déplacement d'un objet physique (400) a l'interieur de cet espace tout en observant a la fois l'objet en projection tridimensionnelle et l'objet physique. Le systeme informatique surveille la position de l'utilisateur pour determiner la position de l'image d'interface dans l'espace. Il surveille egalement le déplacement de l'objet physique afin de determiner sa position. Le systeme genere un signal de commande des que l'objet physique vient couper le plan de l'image d'interface. Ainsi, un programme de traitement de texte est indique par une image d'interface, telle qu'une icone portant la lettre "W" en projection tridimensionnelle, dans l'espace precite. L'activation du traitement de texte intervient aussitot que l'utilisateur deplace son doigt dans l'espace jusqu'a toucher la projection de l'icone.

Main International Patent Class: G09G-005/00

Fulltext Availability:

Detailed Description

Detailed Description

... has spent a life time touching physical objects. This provides for an intuitive interface. The **stereoscopic** projector 200 can be any of several display means capable of displaying three dimensional images. Some projectors require the **user** to wear colored, polarized or active image filter glasses (not shown) to observe the three dimensional image while others are totally contained within a display **headset** worn by the **user**, yet another requires only a display separate from the **user** and no glasses at all. While all displays capable of displaying a three dimensional image are contemplated, the latter is preferred because of the convenience to a **user** requiring no physical contact with the means necessary to display three dimensional images.

FIG. 2...7

in order to determine the corresponding position and orientation. In a heads up stereoscopic **head set** display, the cameras could be preferably mounted on the **head set** for visually monitoring physical objects in same space in which the **user** observes the projected **stereoscopic** images. In alternate embodiments other techniques may be used to determine the aforesaid positions and...

21/5,K/10 (Item 9 from file: 349)
DIALOG(R) File 349:PCT FULLTEXT
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00456942

INTERACTIVE DESK

TABLE DE TRAVAIL INTERACTIVE

Patent Applicant/Assignee:

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LIPSON Hod,

Inventor(s):

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LIPSON Hod,

Patent and Priority Information (Country, Number, Date):

Patent: WO 9847406 A2 19981029

Application: WO 98IL131 19980324 (PCT/WO IL9800131)

Priority Application: US 97838929 19970423

Designated States: AL AM AT AT AU AZ BA BB BG BR BY CA CH CN CU CZ CZ DE DE

August 20, 2003

DK DK EE EE ES FI FI GB GE GH GM GW HU ID IL IS JP KE KG KP KR KZ LC LK
LR LS LT LU LV MD MG MK MN MW MX NO NZ PL PT RO RU SD SE SG SI SK SL
TJ TM TR TT UA UG US UZ VN YU ZW GH GM KE LS MW SD SZ UG ZW AM AZ BY KG
KZ MD RU TJ TM AT BE CH DE DK ES FI FR GB GR IE IT LU MC NL PT SE BF BJ
CF CG CI CM GA GN ML MR NE SN TD TG

Main International Patent Class: G09G-001/08

International Patent Class: G09G-005/00 ; G09G-003/00; G03B-021/00;
G03B-021/14

Publication Language: English

Fulltext Availability:

Detailed Description

Claims

Fulltext Word Count: 3098

English Abstract

An interactive desk system (10) comprising a horizontal desktop (14), part of which is at least partially light transmissive, the part having an underside surface, a top display surface (26), a user-positionable and operable locator providing an output indication of its location, a computer (32) receiving the output indication of the location of the locator, a display projector coupled to the computer for projecting the pattern through the underside surface of the desktop surface to be visible on the top display surface.

French Abstract

Système de table de travail interactive, comprenant une surface de travail sensiblement horizontale, dont au moins une partie transmet partiellement la lumière et comporte une surface inférieure; une surface supérieure de visualisation; un releveur de coordonnées qui peut être positionné et actionné par l'utilisateur, et émet une sortie indiquant sa position, pouvant être placée sur la surface de visualisation supérieure; un ordinateur qui reçoit la sortie indicatrice de la position du releveur de coordonnées et génère un motif dérivé au moins partiellement de cette sortie; et un projecteur d'affichage couplé à l'ordinateur pour projeter le motif à travers la face inférieure de la surface de travail, de manière qu'il soit visible sur la surface supérieure de visualisation.

International Patent Class: G09G-005/00 ...

Fulltext Availability:

Detailed Description

Detailed Description

... the present invention. In this embodiment the desktop image is created by projecting a preferably **stereoscopic** image onto a partially transmissive surface between the users eyes and the

7

desktop, with appropriate perspective and focus so that it appears to the **user** -to-be residing on the desktop itself In the preferred embodiment shown in Fig 10, the transmissive surface is fixed to the users head by means of a **head - mounted display** 102, such as the "Datavisor" commercially available from Nvision Inc. The image is updated in accordance with the **user** movements, with respect to the desktop, by means of a **head tracking** device such as "Flock of birds" commercially available from Polhemous.

It will be appreciated by...

21/5,K/11 (Item 10 from file: 349)

DIALOG(R)File 349:PCT FULLTEXT

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00408336 **Image available**

METHOD AND APPARATUS FOR ORIENTATION SENSING AND DIRECTIONAL SOUND
GENERATION

August 20, 2003

PROCEDE ET APPAREIL POUR LA DETECTION DE L'ORIENTATION ET LA PRODUCTION
D'UN SON DIRECTIONNEL

Patent Applicant/Assignee:
IMMERSIVE TECHNOLOGIES INC,

Inventor(s):

ROELL Richard,
ROGERS James,

Patent and Priority Information (Country, Number, Date):

Patent: WO 9749081 A1 19971224

Application: WO 97US10107 19970620 (PCT/WO US9710107)

Priority Application: US 96667815 19960620; US 96694789 19960809

Designated States: AL AM AT AU AZ BA BB BG BR BY CA CH CN CU CZ DE DK EE ES
FI GB GE HU IL IS JP KE KG KP KR KZ LC LK LR LS LT LU LV MD MG MK MN MW
MX NO NZ PL PT RO RU SD SE SG SI SK TJ TM TR TT UA UG UZ VN GH KE LS MW
SD SZ UG ZW AM AZ BY KG KZ MD RU TJ TM AT BE CH DE DK ES FI FR GB GR IE
IT LU MC NL PT SE BF BJ CF CG CI CM GA GN ML MR NE SN TD TG

Main International Patent Class: G09G-005/00

Publication Language: English

Fulltext Availability:

Detailed Description

Claims

Fulltext Word Count: 6401

English Abstract

A viewing apparatus (50) comprises a visual display (104) transmitting image data to a user and rotatably coupled, in three dimensions, to a boom (102) supporting the visual display (104). The operator inserts his head into the visual display (104) and grasps the control grips (144) with both hands to interact in three dimensions with a virtual world and with virtual objects in the virtual world via graphics displayed to each eye. The visual display (104) is equipped with sensing devices for sensing both location and directional coordinates in three dimensions relative to the user and the virtual world and objects. The visual display (104) houses two LCD displays which direct separate images to the user's eyes so that the images are perceived stereoscopically and speakers positioned forward of the user's ears (115, 117) and the speakers positioned rearward of the user's ears (116, 118) so that sound can be perceived to originate from a particular direction or object.

French Abstract

Un appareil de visualisation (50) comporte un affichage visuel (104) transmettant des donnees d'image a un utilisateur et accouple de maniere rotative, en trois dimensions, a un bras articule (102) supportant l'affichage visuel (104). L'utilisateur introduit sa tete dans l'affichage visuel (104) et s'empare des poignees de commande (144) avec les deux mains pour interagir en trois dimensions avec un monde virtuel et avec des objets virtuels de ce monde virtuel par l'intermediaire de graphiques s'affichant devant chaque oeil. L'affichage visuel (104) est pourvu de dispositifs de detection permettant de detecter des coordonnees locatives et directionnelles en trois dimensions par rapport a l'utilisateur ainsi qu'au monde et aux objets virtuels. L'affichage visuel (104) abrite deux affichages a cristaux liquides dirigeant des images separees vers les yeux de l'utilisateur afin de permettre une perception stereoscopique des images, ainsi que des haut-parleurs places a l'avant des oreilles de l'utilisateur (115, 117) et des haut-parleurs places a l'arriere des oreilles de l'utilisateur (116, 118) afin que le son puisse etre percu comme provenant d'une direction ou d'un objet particuliers.

Main International Patent Class: G09G-005/00

Fulltext Availability:

Detailed Description

Detailed Description

... objects in the virtual world may be perceived to move relative to the

August 20, 2003

Main International Patent Class: G09G-005/00
Publication Language: English
Fulltext Availability:
Detailed Description
Claims
Fulltext Word Count: 9356

English Abstract

A motion control device (16) for a virtual environment, robot or vehicle. The controller allows the user enough movement in the real world to create a sense of reality and presence in the virtual environment. A user is positioned on a surface and is able to move within multiple control regions (24, 26). The virtual environment, robot or vehicle responds differently to inputs from a first control region (24) than from a second control region (26).

French Abstract

Cette invention concerne un dispositif de commande de mouvements (16) pour un environnement virtuel, un robot ou un vehicule. Le dispositif de commande donne a l'utilisateur une liberte de mouvement suffisante dans le monde reel pour creer une impression de realisme et de presence dans l'environnement virtuel. Un utilisateur se trouve sur une surface et peut se deplacer dans plusieurs zones de commande (24, 26). L'environnement virtuel, le robot ou le vehicule repondent differemment aux entrees selon qu'elles proviennent de la premiere zone de commande (24) ou de la deuxieme (26).

Main International Patent Class: G09G-005/00
Fulltext Availability:
Detailed Description

Detailed Description

... pilot sits in the cockpit and controls the aircraft. The object is to train the **operator** and provide a near-real experience. The use of a vehicle as an input device is common in many **simulator** and game environments. Another known input device is a hand-controlled device. Kim et al...

...Reality: Designing Metaphor for Novice Users," describe a virtual reality setup, consisting of a tracked **head - mounted display** and a 3D input device. In a technique called the flying hand a **user** makes a hand gesture (e.g., presses a button on a "bird" device). The orientation and location of the bird device relative to the **head mounted display** determines the I O direction and velocity of motion. In a technique called the floating guide a small sphere floats with the **user**. To change position the **user** moves their hand to the sphere, which always remains in the upper right corner of the field of view. In a technique called the lean-based technique, a **user**'s head displacement (i) in one version is modified by an exponential function to distort...

21/5,K/13 (Item 12 from file: 349)
DIALOG(R)File 349:PCT FULLTEXT
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00326226

OPTICAL SYSTEM FOR A HEAD MOUNTED DISPLAY COMBINING HIGH AND LOW
RESOLUTIONS IMAGES
SYSTEME OPTIQUE POUR AFFICHAGE FRONTAL ASSOCIANT DES IMAGES A HAUTE ET A
FAIBLE RESOLUTION

Patent Applicant/Assignee:

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Inventor(s):

FERGASON James L,

Patent and Priority Information (Country, Number, Date):

August 20, 2003

Patent: WO 9608736 A2 19960321
Application: WO 95US10798 19950824 (PCT/WO US9510798)
Priority Application: US 94295383 19940824; US 94328371 19941025; US
952780 19950719
Designated States: AM AT AU BB BG BR BY CA CH CN CZ DE DK EE ES FI GB GE HU
JP KE KG KP KR KZ LK LR LT LU LV MD MG MK MN MW MX NO NZ PL PT RO RU SD
SE SI SK TJ TT UA UG US UZ VN KE MW SD SZ UG AT BE CH DE DK ES FR GB GR
IE IT LU MC NL PT SE BF BJ CF CG CI CM GA GN ML MR NE SN TD TG
Main International Patent Class: G09G-005/00
Publication Language: English
Fulltext Availability:
Detailed Description
Claims
Fulltext Word Count: 14538

English Abstract

A display system includes a relatively higher resolution display for presenting visual information, and a relatively lower resolution display for presenting visual information, the displays being positioned to present the visual information images therefrom in substantially side-by-side relation, the lower resolution image being provided by the cooperation of focusing optics which form a real image at a retroreflector, which reflects light along an optical path conjugate with light incident thereon to provide an image for viewing, and the higher resolution image being provided without passing through the focusing optics. A method of display includes forming a relatively lower resolution real image, reflecting the image to the eye of an observer, forming a relatively higher resolution image, and directing the relatively higher resolution image to the eye of the observer such that at least a portion of the relatively lower resolution image circumscribes at least a portion of the relatively higher resolution image.

French Abstract

Système de visualisation comprenant un afficheur à résolution relativement haute destiné à présenter des informations visuelles, et un afficheur à résolution relativement faible destiné à présenter des informations visuelles, ces afficheurs étant disposés de manière à présenter les images d'informations visuelles sensiblement en juxtaposition, l'image à faible résolution étant créée par l'action d'une optique de focalisation formant une image réelle au niveau d'un retroreflecteur qui renvoie la lumière le long d'un parcours optique conjugué avec la lumière incidente sur ce réflecteur, afin de former l'image à visualiser, et l'image à haute résolution étant créée sans l'intervention de l'optique de focalisation. Un procédé d'affichage consiste à former une image réelle à résolution relativement faible, à réfléchir l'image en direction de l'œil de l'observateur, à former une image à résolution relativement haute, et à diriger cette dernière en direction de l'œil de l'observateur, de sorte qu'au moins une partie de l'image à résolution relativement faible entoure au moins une partie de l'image à résolution relativement haute.

Main International Patent Class: G09G-005/00

Fulltext Availability:

Claims

Claim

... an eyeglass frame, and/or other support structure in the form of housing 61. The HMD system I' includes two optical viewing systems 4 like the one described above with respect... to provide appropriate positioning of the output ports 42 relative to the eyes of the user. Alternatively, the system I' can be positioned in a relatively fixed location, and the eyes...

...of the eye. This can be accomplished in the manner illustrated in Fig. 6.

The HMD system I can be compact and still provide comfortable viewing

August 20, 2003

distance of about twenty inches...

...as was mentioned above, for example, with respect to the focusing optics 20. In the HMD system 1 of Fig. 6 the viewer is provided with a virtual image 23a of...

...equivalent techniques) for providing light to the image sources. Fig. 7 illustrates another embodiment of HMD system 100, features of which can be used with the several embodiments described above. In...source 2, such light is not necessarily lost to the optical system 10 of the HMD system 100. Rather, such light may be used to increase the brightness of the light...

...of the image viewed by the eye 11. It will be appreciated that the HMD 100 increases the amount of light to the viewer, and, thus, increases the brightness of...

August 20, 2003

19/5,K/1 (Item 1 from file: 349)
DIALOG(R)File 349:PCT FULLTEXT
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00973342 **Image available**

A SUBSCRIBER TELEVISION SYSTEM USER INTERFACE WITH A VIRTUAL REALITY MEDIA SPACE

INTERFACE UTILISATEUR POUR SYSTEME DE TELEVISION D'ABONNE A ESPACE DE MEDIA A REALITE VIRTUELLE

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Patent and Priority Information (Country, Number, Date):

Patent: WO 200303342 A1 20030109 (WO 0303342)

Application: WO 2002US20297 20020625 (PCT/WO US0220297)

Priority Application: US 2001896391 20010629

Designated States: BR CA JP

(EP) AT BE CH CY DE DK ES FI FR GB GR IE IT LU MC NL PT SE TR

Main International Patent Class: G09G-005/00

International Patent Class: G06F-003/00; G06F-013/00; H04N-005/445

Publication Language: English

Filing Language: English

Fulltext Availability:

Detailed Description

Claims

Fulltext Word Count: 8645

English Abstract

The invention provides a method for a subscriber television system (Fig. 1A) client device (130) to provide a three-dimensional user interface comprising a virtual reality media space. The three-dimensional user interface allows the user to navigate a three-dimensional environment, participate in activities, and interact with other users. The three-dimensional user interface enables the user to associate personal characteristics with an avatar which represents the user in the system, such personal characteristics comprising a symbol, a picture, and video.

French Abstract

L'invention porte sur un dispositif client (130) pour systeme de television d'abonne servant d'interface utilisateur tridimensionnelle presentant un espace de media a realite virtuelle. L'interface utilisateur permet a l'utilisateur de naviguer dans un environnement tridimensionnel, de participer a des activites et d'interagir avec d'autres utilisateurs. L'interface utilisateur tridimensionnelle permet a l'utilisateur d'associer ses caracteristiques personnelles, qui comprennent un symbole, une image et une video, a un avatar le representant dans le systeme.

Legal Status (Type, Date, Text)

Publication 20030109 A1 With international search report.

Examination 20030515 Request for preliminary examination prior to end of
19th month from priority date

Main International Patent Class: G09G-005/00

Fulltext Availability:

Detailed Description

Detailed Description

... MS-UI I 00 implementations.

August 20, 2003

FIG. 2 is an illustration of a snapshot of the VR-MS-UI 1 00 (FIG. 1 A) in accordance with one embodiment of the current invention. In the embodiment of the current invention depicted in FIG. 2, the VR-MS-UI 100A consists of a vehicle navigating ...1C) to maneuver around in the 3D Landscape 290 by pressing the up button to move forward and similar buttons for other directions. The Client Command Device 2 160C (FIG. 1C) could also be other instruments, such as a joystick or a...the functions desired the user could, in part, make use of the controls on the VR Dashboard 210. A World Map 220 is a feature that indicates the user's position within the entire current 3D virtual world in relation to other attractions and elements inside the world. This feature allows the user...the user chooses to navigate the 3D Landscape 290 in the virtual vehicle, then the user can control the speed of movement of the virtual vehicle with the Throttle 240 on the VR Dashboard 21 0. Moving the Throttle 240 forward In a non-limiting example, the user would be enabled to move the Throttle 240 through the use of a Client Command Device ...down arrow to throttle down. Selection of the Throttle 240 or other elements of the VR Dashboard 2 1 0 could occur through any of a variety of methods. For example...IC). Another example, among others, includes highlighting, or bringing in focus, various elements of the VR Dashboard 2 1 0 in a looping manner among all selectable items such that a...

19/5,K/2 (Item 2 from file: 349)
DIALOG(R)File 349:PCT FULLTEXT
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00930267

METHOD AND SYSTEM TO PRESENT IMMERSION VIRTUAL SIMULATIONS USING
THREE-DIMENSIONAL MEASUREMENT
PROCEDE ET SYSTEME DE PRESENTATION PAR IMMERSION DE SIMULATIONS VIRTUELLES
PAR IMMERSION, UTILISANT DES MESURES EN 3D

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LLP, Suite 3400, 4 Embarcadero Center, San Francisco, CA 94111-4187, US

Patent and Priority Information (Country, Number, Date):

Patent: WO 200263601 A1 20020815 (WO 0263601)
Application: WO 2002US3433 20020205 (PCT/WO US0203433)
Priority Application: US 2001777778 20010205

Designated States: AE AG AL AM AT AU AZ BA BB BG BR BY BZ CA CH CN CO CR CU

CZ DE DK DM DZ EC EE ES FI GB GD GE GH GM HR HU ID IL IN IS JP KE KG KP
KR KZ LC LK LR LS LT LU LV MA MD MG MK MN MW MX MZ NO NZ OM PH PL PT RO
RU SD SE SG SI SK SL TJ TM TR TT TZ UA UG UZ VN YU ZA ZM ZW

(EP) AT BE CH CY DE DK ES FI FR GB GR IE IT LU MC NL PT SE TR

(OA) BF BJ CF CG CI CM GA GN GQ GW ML MR NE SN TD TG

(AP) GH GM KE LS MW MZ SD SL SZ TZ UG ZM ZW

(EA) AM AZ BY KG KZ MD RU TJ TM

Main International Patent Class: G09G-005/00

International Patent Class: G09G-005/08; G03B-021/00

Publication Language: English

Filing Language: English

Fulltext Availability:

Detailed Description

Claims

Fulltext Word Count: 7663

English Abstract

A virtual **simulation** system generates an image of a virtual control on a display that may be a heads-up-display in a vehicle. The system uses three-dimensional range finding data to determine when a user is sufficiently close to the virtual control to "manipulate" the virtual control. The user "manipulation" is sensed non-haptically by the system, which causes the displayed **control** image to **move** in response to **user manipulation**. System output is coupled, linearly or otherwise, to an actual device having a parameter that is adjusted substantially in real-time by user-manipulation of the virtual image. System generated displays can be dynamic and change appearance when a user's hand is in close proximity displays can disappear until needed, or can include menus and icons to be selected by the user who points towards or touches the virtual images. System generate images can include representation of the user for use in a training or gaming system.

French Abstract

L'invention porte sur un systeme virtuel de simulation elaborant l'image d'une commande virtuelle sur un ecran pouvant etre le dispositif tete haute d'un vehicule. Ledit systeme utilise des donnees de telemetrie en 3D pour determiner quand l'utilisateur est suffisamment rapproche de la commande virtuelle pour pouvoir la "manipuler". Les "manipulation" de l'utilisateur sont detectees non haptiquement par le systeme, ce qui provoque le deplacement des images de commande en reponse a ladite manipulation. Les signaux de sortie du systeme sont couples, lineairement ou autrement, a un dispositif reel presentant un parametre s'ajustant sensiblement en temps reel lors de la manipulation de l'image virtuelle par l'utilisateur. Les images produites par le systeme peuvent etre dynamiques et changer d'apparence lorsque l'une des mains de l'utilisateur se trouve a proximite immediate. Les images peuvent disparaitre jusqu'a ce qu'un les utilise, ou peuvent comprendre des menus et des icones selectionnables par l'utilisateur en pointant sur une image virtuelle ou en la touchant. Les images produites par le systeme peuvent comprendre une representation de l'utilisateur utilisable dans des systeme de jeu ou d'entrainement.

Legal Status (Type, Date, Text)

Publication 20020815 A1 With international search report.

Publication 20020815 A1 Before the expiration of the time limit for amending the claims and to be republished in the event of the receipt of amendments.

Examination 20030213 Request for preliminary examination prior to end of 19th month from priority date

Main International Patent Class: G09G-005/00

Fulltext Availability:

Claims

English Abstract

A virtual **simulation** system generates an image of a virtual control on a display that may be a...

...control. The user "manipulation" is sensed non-haptically by the system, which causes the displayed **control** image to **move** in response to **user manipulation**. System output is coupled, linearly or otherwise, to an actual device having a parameter that...

Claim

... said image on said display;

(c) determining non-haptically from data sensed at step (b), **user** intended **movement** of said image of said **control**; and
(d) outputting a signal coupleable to said actual device to **control**

August 20, 2003

said
parameter as a function of sensed user intended movement of said
image of said control .

1 5

2 The method of claim 1 , wherein at step (a), said display is...

19/5,K/3 (Item 3 from file: 349)
DIALOG(R)File 349:PCT FULLTEXT
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00779767 **Image available**

VIBROTACTILE HAPTIC FEEDBACK DEVICES
DISPOSITIFS VIBROTACTILES A RETOUR TACTILE

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Legal Representative:

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Palo Alto, CA 94303, US,

Patent and Priority Information (Country, Number, Date):

Patent: WO 200113354 A1 20010222 (WO 0113354)
Application: WO 2000US22761 20000818 (PCT/WO US0022761)
Priority Application: US 99149782 19990818

Designated States: AE AG AL AM AT AU AZ BA BB BG BR BY BZ CA CH CN CU CZ DE
(utility model) DK DM DZ EE ES FI GB GD GE GH GM HR HU ID IL IS JP KE KG
KP KR KZ LC LK LR LS LT LU LV MA MD MG MK MN MW MX MZ NO NZ PL PT RO RU
SD SE SG SI SK SL TJ TM TR TT TZ UA UG UZ VN YU ZA ZW
(EP) AT BE CH CY DE DK ES FI FR GB GR IE IT LU MC NL PT SE
(OA) BF BJ CF CG CI CM GA GN GW ML MR NE SN TD TG
(AP) GH GM KE LS MW MZ SD SL SZ TZ UG ZW
(EA) AM AZ BY KG KZ MD RU TJ TM

Main International Patent Class: G09G-005/00

International Patent Class: G09G-005/08

Publication Language: English

Filing Language: English

Fulltext Availability:

Detailed Description

Claims

Fulltext Word Count: 13378

English Abstract

Method and apparatus for controlling magnitude and frequency of
vibrotactile sensations for haptic feedback devices. A haptic feedback
device, such as a gamepad controller, mouse, remote control, etc.,
includes a housing (14) grasped by the user, an actuator (30) coupled to
the housing, and a mass. In some embodiments, the mass can be oscillated
by the actuator and a coupling between the actuator and the mass or
between the mass and the housing has a compliance that can be varied.
Varying the compliance allows vibrotactile sensations having different
magnitudes for a given drive signal to be output to the user grasping the
housing. In other embodiments, the actuator is a rotary actuator and the
mass is an eccentric mass rotatable by the actuator about an axis of
rotation. The eccentric mass has an eccentricity that can be varied
relative to the axis of rotation while the mass is rotating. Varying the
eccentricity allows vibrotactile sensations having different magnitudes
for a given drive signal to be output to the user grasping the housing.

French Abstract

August 20, 2003

L'invention concerne un procede et un dispositif servant a commander l'intensite et la frequence de sensations vibrotactiles de dispositifs a retour tactile. Un dispositif a retour tactile, tel qu'un organe de commande de tablette de jeu, une souris, une telecommande, etc., comprend un corps (14) tenu par l'utilisateur, un actionneur (30) couple au corps et une masse. Dans certaines formes de realisation, l'actionneur peut faire osciller la masse, et un couplage entre l'actionneur et la masse ou entre la masse et le corps presente une compliance pouvant etre modifiee. Une modification de la compliance permet de produire sur l'utilisateur tenant le corps des sensations vibrotactiles de differentes intensites pour un signal de commande donne. Dans d'autres formes de realisation, l'actionneur est un actionneur rotatif et la masse est une masse excentree pouvant etre tournee par l'actionneur autour d'un axe de rotation. La masse excentree presente une excentricite pouvant etre modifiee par rapport a l'axe de rotation pendant que la masse tourne. Une modification de l'excentricite permet de produire sur l'utilisateur tenant le corps des sensations vibrotactiles de differentes intensites pour un signal de commande donne.

Legal Status (Type, Date, Text)

Publication 20010222 A1 With international search report.

Publication 20010222 A1 Before the expiration of the time limit for amending the claims and to be republished in the event of receipt of amendments.

Correction 20020912 Corrected version of Pamphlet: pages 1/13-13/13, drawings, replaced by new pages 1/13-13/13; due to late transmittal by the receiving Office

Republication 20020912 A1 With international search report.

Main International Patent Class: G09G-005/00

Fulltext Availability:

Detailed Description

Detailed Description

... 14. For example, the host application program can be a video or computer game, medical **simulation**, scientific analysis program, operating system, graphical user interface, or other application program that utilizes force...

...For example, when a user-controlled vehicle collides with a fence in a game or **simulation**, a vibration can be output to the user to enhance the interactive experience of the collision. Similarly, when a **user - controlled cursor moves** onto another object such as an icon or text heading, vibrations can be used to...

19/5,K/4 (Item 4 from file: 349)

DIALOG(R) File 349:PCT FULLTEXT

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00563518 **Image available**

FORCE FEEDBACK DEVICE INCLUDING ACTUATOR WITH MOVING MAGNET

DISPOSITIF A RETROACTION DE FORCE COMPRENANT UN ACTIONNEUR A AIMANT MOBILE

Patent Applicant/Assignee:

IMMERSION CORPORATION,

Inventor(s):

SCHEMA Bruce M,
ROSENBERG Louis B,

Patent and Priority Information (Country, Number, Date):

Patent: WO 200026891 A1 20000511 (WO 0026891)

Application: WO 99US25809 19991102 (PCT/WO US9925809)

Priority Application: US 98107267 19981104; US 99431383 19991101

Designated States: AL AM AT AU AZ BA BB BG BR BY CA CH CN CU CZ DE DK EE ES,

FI GB GE GH GM HR HU ID IL IS JP KE KG KP KR KZ LC LK LR LS LT LU LV MD

MG MK MN MW MX NO NZ PL PT RO RU SD SE SG SI SK SL TJ TM TR TT UA UG UZ

August 20, 2003

VN YU ZW GH GM KE LS MW SD SL SZ TZ UG ZW AM AZ BY KG KZ MD RU TJ TM AT
BE CH CY DE DK ES FI FR GB GR IE IT LU MC NL PT SE BF BJ CF CG CI CM GA
GN GW ML MR NE SN TD TG

Main International Patent Class: G09G-005/00

Publication Language: English

Fulltext Availability:

Detailed Description

Claims

Fulltext Word Count: 11695

English Abstract

A force feedback interface (200) is coupled to a host computer (202) that displays a graphical environment, the device including a user manipulatable object (14) physically contacted and moveable by a user. A sensor (226) detects a position of the user, where the sensor signal includes information representative of the position of the user object. An actuator (228) is coupled to the user object and outputs a force on the user manipulatable object. The actuator includes a magnet (45) and a grounded coil (50) and wherein a current is provided in the coil to generate the force.

French Abstract

L'invention concerne une interface a retroaction (200) de force, couplee a un ordinateur hote (202), qui affiche un environnement graphique. Le dispositif comprend un objet (14) manipulable par un utilisateur, en contact physique et mobile avec celui-ci. Un capteur (226) detecte une position de l'utilisateur, le signal du capteur renfermant des informations representant la position de l'objet de l'utilisateur. Un actionneur (228) est couple a l'objet et envoie une force sur l'objet manipulable par l'utilisateur. L'actionneur comprend un aimant (45) et une bobine a la terre (50), un courant etant envoye a la bobine afin de produire la force.

Main International Patent Class: G09G-005/00

Fulltext Availability:

Detailed Description

Detailed Description

... controlling the displayed environment. The computer updates the game or simulation in response to the user's manipulation of a moved object such as a joystick handle or mouse, and provides feedback to the user utilizing the display screen and, typically, audio...

...object of the interface device, such as a joystick, mouse, steering wheel, stylus, etc., and moves the object in provided degrees of freedom. The movement of the user manipulatable object is sensed by the host computer using sensors, and force sensations controlled by the

...

19/5,K/5 (Item 5 from file: 349)

DIALOG(R)File 349:PCT FULLTEXT

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00479520 **Image available**

MOUSE INTERFACE DEVICE AND METHOD FOR PROVIDING ENHANCED CURSOR CONTROL
DISPOSITIF D'INTERFACE SOURIS ET PROCEDE PERMETTANT D'AMELIORER LA COMMANDE
DU CURSEUR

Patent Applicant/Assignee:

IMMERSION HUMAN INTERFACE CORPORATION,

Inventor(s):

ROSENBERG Louis B,

BEAMER Jonathan L,

BRAUN Adam C,

CHANG Dean C,

August 20, 2003

Patent and Priority Information (Country, Number, Date):

Patent: WO 9910872 A1 19990304
Application: WO 98US17445 19980821 (PCT/WO US9817445)
Priority Application: US 97924462 19970823
Designated States: AU CA CN JP MX AT BE CH CY DE DK ES FI FR GB GR IE IT LU
MC NL PT SE
Main International Patent Class: G09G-005/00
International Patent Class: G09G-005/08
Publication Language: English
Fulltext Availability:
Detailed Description
Claims
Fulltext Word Count: 28304

English Abstract

A force feedback interface device (14), coupled to a host computer (18), includes a manipulandum (12), such as a mouse, that is moveable in a local workspace (24). A cursor position (222) in the display frame (28) is reported to the host computer (18) derived from a reference position (204) of the mouse (12) in the local frame (30), and the host (18) displays the cursor (180); for example, the cursor position (222) may be scaled by a ballistics algorithm (206) based on mouse velocity to allow fine positioning or coarse motion of the cursor (180). A force (216) is output on the mouse (12), the force (216) being determined based on mouse reference data or cursor ballistics data, depending on the type of force, to reduce distortion between visual and force outputs. Assistive forces and indexing features are also provided to achieve the enhanced cursor control.

French Abstract

L'invention concerne un dispositif d'interface a retour d'effort (14) qui est couple a un ordinateur hote (18) et qui comprend un objet de manipulation (12), tel qu'une souris, que l'on peut deplacer sur un espace de travail local (24). Une position du curseur (222) dans le cadre d'affichage (28) est communiquee a l'ordinateur hote (18) par rapport a une position de reference (204) de la souris (12) dans le cadre local (30), puis l'hote (18) affiche le curseur (180). On peut par exemple calculer la position du curseur (222) au moyen d'un algorithme de balistique (206) base sur la vitesse de la souris, afin de permettre un positionnement precis ou un deplacement grossier du curseur (180). Un effort (216) est exerce sur la souris (12), l'effort (216) etant determine d'apres les donnees de reference souris ou les donnees balistiques curseur, en fonction du type d'effort, de maniere a reduire la distorsion entre les sorties visuelles et les sorties d'effort. Des efforts accessoires et des fonctions d'indexation permettent en outre d'ameliorer la commande du curseur.

Main International Patent Class: G09G-005/00

Fulltext Availability:
Detailed Description

Detailed Description

... video game, a

14

user can be controlling a computer player or vehicle in the **virtual environment** by manipulating the mouse 12. The computer system tracks the position of the mouse with sensors as the **user moves** it. The computer system may also provide force feedback **commands** to the mouse, for example, when the **user moves** the graphical object against a generated surface such as an edge of a window, a...

19/5,K/6 (Item 6 from file: 349)

DIALOG(R) File 349: PCT FULLTEXT

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August 20, 2003

00433719 **Image available**

MOUSE INTERFACE DEVICE FOR PROVIDING FORCE FEEDBACK
DISPOSITIF D'INTERFACE DE SOURIS POUR FOURNIR UN RETOUR DE FORCE

Patent Applicant/Assignee:

IMMERSION HUMAN INTERFACE CORPORATION,
SCHENA Bruce M,
ROSENBERG Louis B,

Inventor(s):

SCHENA Bruce M,
ROSENBERG Louis B,

Patent and Priority Information (Country, Number, Date):

Patent: WO 9824183 A1 19980604

Application: WO 97US21601 19971125 (PCT/WO US9721601)

Priority Application: US 96756745 19961126; US 97881691 19970624; US
97965720 19971107

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FI GB GE GH HU ID IL IS JP KE KG KP KR KZ LC LK LR LS LT LU LV MD MG MK
MN MW MX NO NZ PL PT RO RU SD SE SG SI SK SL TJ TM TR TT UA UG US UZ VN
YU ZW GH KE LS MW SD SZ UG ZW AM AZ BY KG KZ MD RU TJ TM AT BE CH DE DK
ES FI FR GB GR IE IT LU MC NL PT SE BF BJ CF CG CI CM GA GN ML MR NE SN
TD TG

Main International Patent Class: H03K-017/94

International Patent Class: H03M-011/00; G09G-005/08; G09G-005/00 ;

H01H-019/00; H01H-021/00; G05G-009/00; G05G-013/00

Publication Language: English

Fulltext Availability:

Detailed Description

Claims

Fulltext Word Count: 29605

English Abstract

A force feedback mouse interface device as shown in the Figure connected to a host computer and providing realistic force feedback to a user. The mouse interface device (11) includes a mouse object (12) and a linkage (40) coupled to the mouse that includes a plurality of members (46, 50) rotatably coupled to each other in a planar closed-loop linkage, two of the members coupled to ground and rotatable about the same axis (52). Two actuators (64), preferably electromagnetic voice coils, provide forces in the two degrees of freedom of the planar workspace of the mouse object. Each of the actuators includes a moveable coil portion (64a) integrated with one of the members of the linkage and a magnet portion (90a) coupled to the ground surface through which the coil portion moves. At least one sensor (62) is coupled to the ground surface that detects movement of the linkage and provides a sensor signal including information from which a position of the mouse object in the planar workspace can be determined.

French Abstract

Un dispositif d'interface de souris a retour de force est connecte a un ordinateur hote et fournit a l'utilisateur un retour de force realiste. Le dispositif d'interface de souris (11) comprend la souris (12) proprement dite et un systeme articule (40) couple a la souris, qui comprend une pluralite d'elements (46, 50) accouples rotatifs l'un a l'autre pour former un systeme articule en boucle fermee plane, deux des elements etant couples a la base et pouvant tourner autour du meme axe (52). Deux dispositifs d'actionnement (64), de preference deux bobines electromagnetiques mobiles, produisent des forces correspondant aux deux degres de liberte de l'espace de travail plan de la souris. Chacun des dispositifs d'actionnement comprend une portion bobine mobile (64a), integree a un des elements du systeme articule et une portion aimant (90a) couplee a la surface de base a travers laquelle la portion de bobine se deplace. Au moins un detecteur (62) est couple a la surface de base pour detecter le mouvement du systeme articule et fournir un signal de detection comprenant une information a partir de laquelle la position de la souris peut etre determinee dans l'espace de travail plan.

August 20, 2003

...International Patent Class: G09G-005/00
Fulltext Availability:
Detailed Description

Detailed Description

... as well as rotary degrees of freedom. For many applications, mouse 12 need only be moved in a very small In a preferred embodiment, the user manipulates mouse 12 in a planar workspace, much like a traditional mouse, and the ...medical simulation, can be displayed, e.g., images of tissue and a representation of a manipulated user object 12 moving through the tissue, etc.

There are two primary " control paradigms" of operation for mouse system 10: position control and rate control. Position control is...

19/5,K/7 (Item 7 from file: 349)
DIALOG(R)File 349:PCT FULLTEXT
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00408336 **Image available**
METHOD AND APPARATUS FOR ORIENTATION SENSING AND DIRECTIONAL SOUND
GENERATION
PROCEDE ET APPAREIL POUR LA DETECTION DE L'ORIENTATION ET LA PRODUCTION
D'UN SON DIRECTIONNEL
Patent Applicant/Assignee:
IMMERSIVE TECHNOLOGIES INC,
Inventor(s):
ROELL Richard,
ROGERS James,
Patent and Priority Information (Country, Number, Date):
Patent: WO 9749081 A1 19971224
Application: WO 97US10107 19970620 (PCT/WO US9710107)
Priority Application: US 96667815 19960620; US 96694789 19960809
Designated States: AL AM AT AU AZ BA BB BG BR BY CA CH CN CU CZ DE DK EE ES
FI GB GE HU IL IS JP KE KG KP KR KZ LC LK LR LS LT LU LV MD MG MK MN MW
MX NO NZ PL PT RO RU SD SE SG SI SK TJ TM TR TT UA UG UZ VN GH KE LS MW
SD SZ UG ZW AM AZ BY KG KZ MD RU TJ TM AT BE CH DE DK ES FI FR GB GR IE
IT LU MC NL PT SE BF BJ CF CG CI CM GA GN ML MR NE SN TD TG
Main International Patent Class: G09G-005/00
Publication Language: English
Fulltext Availability:
Detailed Description
Claims
Fulltext Word Count: 6401

English Abstract

A viewing apparatus (50) comprises a visual display (104) transmitting image data to a user and rotatably coupled, in three dimensions, to a boom (102) supporting the visual display (104). The operator inserts his head into the visual display (104) and grasps the control grips (144) with both hands to interact in three dimensions with a virtual world and with virtual objects in the virtual world via graphics displayed to each eye. The visual display (104) is equipped with sensing devices for sensing both location and directional coordinates in three dimensions relative to the user and the virtual world and objects. The visual display (104) houses two LCD displays which direct separate images to the user's eyes so that the images are perceived stereoscopically and speakers positioned forward of the user's ears (115, 117) and the speakers positioned rearward of the user's ears (116, 118) so that sound can be perceived to originate from a particular direction or object.

French Abstract

Un appareil de visualisation (50) comporte un affichage visuel (104) transmettant des donnees d'image a un utilisateur et accouple de maniere

August 20, 2003

rotative, en trois dimensions, a un bras articule (102) supportant l'affichage visuel (104). L'utilisateur introduit sa tete dans l'affichage visuel (104) et s'empare des poignees de commande (144) avec les deux mains pour interagir en trois dimensions avec un monde virtuel et avec des objets virtuels de ce monde virtuel par l'intermediaire de graphiques s'affichant devant chaque oeil. L'affichage visuel (104) est pourvu de dispositifs de detection permettant de detecter des coordonnees locatives et directionnelles en trois dimensions par rapport a l'utilisateur ainsi qu'au monde et aux objets virtuels. L'affichage visuel (104) abrite deux affichages a cristaux liquides dirigeant des images separees vers les yeux de l'utilisateur afin de permettre une perception stereoscopique des images, ainsi que des haut-parleurs places a l'avant des oreilles de l'utilisateur (115, 117) et des haut-parleurs places a l'arriere des oreilles de l'utilisateur (116, 118) afin que le son puisse etre percu comme provenant d'une direction ou d'un objet particuliers.

Main International Patent Class: **G09G-005/00**
Fulltext Availability:
Detailed Description

Detailed Description
... the user's head with the 3dimensional world. Additional signals can be transmitted from the **handle** 144 of the apparatus 50, which enables the **user** to **move** in translation in the **virtual world** e.g., forward, backward, up, down, left, and right. The additional translation movement controls can...

...of the visual display 104, and may be limited only by the definition of the **virtual world**.

As will be readily appreciated by those skilled in the art, the present invention provides...

19/5,K/8 (Item 8 from file: 349)
DIALOG(R) File 349:PCT FULLTEXT
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00404031 **Image available**
**METHOD AND APPARATUS FOR PROVIDING SIMULATED PHYSICAL INTERACTIONS WITHIN
COMPUTER GENERATED ENVIRONMENTS**
**PROCEDE ET APPAREIL POUR PRODUIRE DES INTERACTIONS PHYSIQUES SIMULEES DANS
DES ENVIRONNEMENTS GENERES PAR ORDINATEUR**

Patent Applicant/Assignee:
IMMERSION HUMAN INTERFACE CORPORATION,
ROSENBERG Louis,
BRAVE Scott B,

Inventor(s):
ROSENBERG Louis,
BRAVE Scott B,

Patent and Priority Information (Country, Number, Date):

Patent: WO 9744775 A1 19971127
Application: WO 97US8339 19970516 (PCT/WO US9708339)
Priority Application: US 9617803 19960517; US 96664086 19960614
Designated States: AU CA CN JP KR MX US AT BE CH DE DK ES FI FR GB GR IE IT
LU MC NL PT SE

Main International Patent Class: **G09G-005/00**
International Patent Class: G09G-05:08; G06F-03:00; B25J-09:18; G05B-19:19;
G05B-19:408; G06F-17:00; G06G-07:48; A63B-71:00; A63B-24:00
Publication Language: English
Fulltext Availability:
Detailed Description
Claims
Fulltext Word Count: 32511

English Abstract

A method and apparatus for providing force feedback to a user operating a human/computer interface device (14) and interacting with a computer-generated simulation (20). In one aspect, a computer implemented method simulates the interaction of simulated objects displayed to a user who controls one of the simulated objects by manipulating a physical object (34) of an interface device (14). The physical object provides force feedback to the user which imparts a physical sensation corresponding to the interaction of the computer simulated objects.

French Abstract

Cette invention se rapporte a un procede et a un appareil servant a produire une force de retour a destination d'un utilisateur actionnant un dispositif d'interface homme/ordinateur (14) et interagissant avec une simulation generee par ordinateur (20). Dans un aspect de cette invention, un procede mis en oeuvre par ordinateur simule l'interaction d'objets simules presentes a un utilisateur qui commande l'un des objets simules en manipulant un objet physique (34) d'un dispositif d'interface (14). L'objet physique fournit a l'utilisateur une force de retour qui donne une sensation physique correspondant a l'interaction des objets simules par ordinateur.

Main International Patent Class: G09G-005/00

Fulltext Availability:

Detailed Description

Claims

Detailed Description

... projected from beneath a table surface. The interface device of the game apparatus includes a **handle** for the **user** to grasp and **move** in the two degrees of ...degrees of freedom and a sensor stage allows a player to interact with a sporting **simulation**.

An embodiment of the present invention for a sporting simulation includes a paddle simulated object...of the present invention;

Figures 7a-c illustrate the use of an interface device to **move** a **user** - **controlled** simulated object into an obstruction object according to the present invention; Figures 8a-c illustrate...by hand, with their fingertips, or even orally in the case of handicapped persons. The **user** can **manipulate** and **move** the object along provided degrees of freedom to interface with the **simulation** or application program implemented by the host computer. User object 34 can be a joystick...

...A user object 34 and interface device 14 for simulating a racquet in a sporting **simulation** is described in greater detail with respect to Figure 19.

User object 34 is preferably...using a host command, as explained below. In the described example, paddle object 220 is **controlled** by a player by a position **control** paradigm such that the **movement** of paddle object 220 is directly mapped to **movement** of **user** object 34. In alternate embodiments, ball object 206 or both objects can be controlled by...In other embodiments, the host computer generating the motion simulation (or a different computer) can **control** the second **moving** simulated object instead of a second **user**. The computer's simulated object can be given a weight as well.

In still another...directly onto the planar workspace of the interface device 506 and 506' such that the **user** is **moving** the **user** object among the images. In one example, the **user** could **move** the physical **handle** 516 of an interface device directly into a projected image of a wall, and the...

August 20, 2003

...handle could not be moved through. This allows a greater sense of immersion into the **simulation** .

FIGURE 17 illustrates a "reverse projection" embodiment 540 of the game apparatus of the present...embodiment allows a player object to move within a simulation "space" based on a rate **control** paradigm **controlled** by the **user** 's **movement** on stage 568. For example, in a simulated tennis game, the player could lean left...

Claim

... is trapped as if said paddle is a flexible sling, and wherein when said trap **command** is removed while said ball object is **moved** by said **user** in an approximately circular path, said ball object is disengaged and **moved** tangential to said circular path away from said paddle object.

53 A method as recited...

19/5,K/9 (Item 9 from file: 349)
DIALOG(R)File 349:PCT FULLTEXT
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00401876 **Image available**

VIRTUAL MOTION CONTROLLER

DISPOSITIF DE COMMANDE DE MOUVEMENTS VIRTUELS

Patent Applicant/Assignee:

UNIVERSITY OF WASHINGTON,

Inventor(s):

WELLS Maxwell J,
MANDEVILLE Jon,
FURNESS Thomas A,
PULKKA Aaron K,
LAMAR Michael,
ATEN Jason,

Patent and Priority Information (Country, Number, Date):

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Application: WO 97US7419 19970502 (PCT/WO US9707419)

Priority Application: US 9616954 19960506

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FI GB GE HU IL IS JP KE KG KP KR KZ LC LK LR LS LT LU LV MD MG MK MN MW
MX NO NZ PL PT RO RU SD SE SG SI SK TJ TM TR TT UA UG UZ VN GH KE LS MW
SD SZ UG AM AZ BY KG KZ MD RU TJ TM AT BE CH DE DK ES FI FR GB GR IE IT
LU MC NL PT SE BF BJ CF CG CI CM GA GN ML MR NE SN TD TG

Main International Patent Class: G09G-005/00

Publication Language: English

Fulltext Availability:

Detailed Description

Claims

Fulltext Word Count: 9356

English Abstract

A motion control device (16) for a **virtual environment** , robot or vehicle. The **controller** allows the **user** enough **movement** in the real world to create a sense of reality and presence in the **virtual environment** . A user is positioned on a surface and is able to move within multiple control regions (24, 26). The **virtual environment** , robot or vehicle responds differently to inputs from a first control region (24) than from a second control region (26).

French Abstract

Cette invention concerne un dispositif de commande de mouvements (16) pour un environnement virtuel, un robot ou un vehicule. Le dispositif de commande donne a l'utilisateur une liberte de mouvement suffisante dans

August 20, 2003

le monde reel pour creer une impression de realisme et de presence dans l'environnement virtuel. Un utilisateur se trouve sur une surface et peut se deplacer dans plusieurs zones de commande (24, 26). L'environnement virtuel, le robot ou le vehicule repondent differemment aux entrees selon qu'elles proviennent de la premiere zone de commande (24) ou de la deuxieme (26).

Main International Patent Class: G09G-005/00

Fulltext Availability:

Detailed Description
Claims

English Abstract

A motion control device (16) for a **virtual environment**, robot or vehicle. The **controller** allows the **user** enough **movement** in the real world to create a sense of reality and presence in the **virtual environment**. A user is positioned on a surface and is able to move within multiple control regions (24, 26). The **virtual environment**, robot or vehicle responds differently to inputs from a first control region (24) than from...

Detailed Description

... The virtual environment is depicted by one or more displays. An input device serves to **control movement** within the **virtual environment**. Conventional **user** input devices for a general purpose computing environment include a keyboard, a pointing device and...

...device serves to control the position of a cursor on a computer screen. For a **virtual environment** a more sophisticated input device is desired.

Sophisticated military flight simulators use an aircraft vehicle...

...Held Miniatures." A hand-held miniature graphical representation of a virtual environment is used to **control movement** in the **virtual environment**. When a **user** moves an iconic representation of himself in the miniature, the **user** moves correspondingly in the **virtual environment**. First the **user** moves the icon, then the miniature graphics change to provide the effect of the user shrinking into the miniature or the miniature expanding to the enlarged **virtual environment**. The motion then occurs. Then, the graphics change to provide the effect of the user growing or the **virtual environment** shrinking.

Iwata et al. describes virtual perambulator prototypes in (i) "Virtual Perambulator: A Novel Interface...virtual environment including, simulation environments, game environment, virtual reality environments or other graphical environment. An **operator** provides inputs to **control movements** and enter **commands** in the **virtual environment** through the input device 16. The processors 18 process the inputs to control what is...

...display device 14 provides visual feedback to the operator. Although other mechanisms for feeding back **virtual environment** information can be implemented, this invention addresses the input device 16 the operator controls to provide input to the host processing system 12. Although a **virtual environment** host is described, the input device also is used for remote control of a robot...

...example, the input device surface 20 is designed to resemble a surfboard for a surfing **virtual environment**. Fig. 2 shows a circular surface 20. ...24, 26. The processor 18 receives input signals from the sensors 22 to determine an **operator** position on the surface 20. **Movement** of the **operator** position within a first **control** zone 24 is processed with a first transformation function. **Movement** of the **operator**

August 20, 2003

position within a second **control zone 26** is processed with a second transformation function. The specific transformation function may vary depending on the **virtual environment** or remote **control** implementation. In a specific embodiment, **movement** of the **operator** position within the first **control zone** is directly transposed to **movement** within the **virtual environment** or of a robot or vehicle. For example a 1 to 1 ratio of movement...

...movement in the first control zone is implemented as a 5 foot movement in the **virtual environment** or of the robot or vehicle. The relative size, shape and location of each control...s center of gravity.

This is taken as the operator position. The location of the **operator** position with respect to the **control zones** determines how **operator movements** are to be processed. **Operator movements** within the inner **control zone 24** are processed according to one transformation function (e.g., direct positional translational). For...

...within the inner control zone is transformed to a movement in such direction in the **virtual environment** or of the robot or vehicle by an amount equal to a gain factor times the amount **moved** in the inner **control zone**. **Operator movements** within the outer **control zone 26** are processed according to another transformation function. For example, a movement in a...

...outer control zone 26 by a given amount is transformed to a movement in the **virtual environment** or of the robot or vehicle in such direction at a velocity equal 1 0...

...within the inner control zone is transformed to a movement in such direction in the **virtual environment** or of the robot or vehicle by an amount equal to a gain factor times the amount **moved** in the inner **control zone**. As the **operator moves** into contact with the ring 134, the **operator** pushes the ring 134 away from

Claim

1 An input apparatus (16) which an **operator** interacts with to **control movement** within a **virtual environment**, the apparatus comprising:
a surface (20) upon which an operator is positioned, the surface defining
...

...a processor (18) receiving the output signal for processing sensor output to
determine a current **operator** position; and
wherein **movement** of the **operator** within a first **control zone (24)** of the multiple concentric control zones causes a first response in the **virtual environment** based upon a first transformation function, and
wherein **movement** of the **operator** within a second **control zone (26)** of the multiple concentric control zones causes a second response in the **virtual environment** based upon a second transformation function which differs from the first transformation function.

2 The...the surface and compares such movement pattern with prestored movement pattern signatures to identify the **movement** pattern.

10 An input apparatus (16) which an **operator** interacts with to **control movement** within a **virtual environment**, the apparatus comprising:
a surface (20) upon which an operator is positioned, the surface defining
...

...plurality of sensors, the processor determining a current operator position relative to the plurality of **control zones** from the sensor output signals; and

August 20, 2003

wherein movement of the operator within a first control zone of the plurality of control zones causes a first response in the virtual environment based upon a first transformation function, and wherein movement of the operator within a second control zone of the plurality of control zones causes a second response in the virtual environment based upon a second transformation function which differs from the first transformation function.
IL The...

...from a time sequence of the output signals.

12 An input apparatus (16) which an operator interacts with to control movement Within a virtual environment, the apparatus comprising: a surface (20) upon which an operator is positioned, the surface defining ...

...zone (24) of the multiple concentric control zones translates directly to positional change within the virtual environment, wherein operator position within a second control zone (26) of the multiple concentric control zones translates to velocity within the virtual environment, and wherein change in operator position within the second control zone 5 corresponds to change in velocity within the virtual environment, and wherein the first control zone is concentrically inward relative to the second control zone...steepness corresponds to velocity within the virtual environment.

16 An input apparatus (16) which an operator interacts with to control movement within a virtual environment, the apparatus comprising: a surface (20) upon which an operator is positioned, the surface defining ...

...the operator position within the first control zone translates directly to positional change within the virtual environment, wherein movement of the operator into contact with the ring deflects a portion of the...

...wherein deflection of the ring into the second control zone translates to velocity within the virtual environment.

17 An input apparatus (16) which an operator interacts with to control movement within a virtual environment, the apparatus comprising: a platform having a surface (20) upon which an operator is positioned...

...control zone of the multiple concentric control zones translates directly to positional change within the virtual environment, wherein change in operator position within a second control zone of the multiple concentric control zones translates to change in velocity within the virtual environment, and wherein the first control zone is concentrically inward relative to the second control zone...

...the surface and compares such movement pattern with prestored movement pattern signatures to identify the movement pattern.

21 A method for an operator to control motion within a virtual environment, wherein the operator is positioned on a surface (20), the surface defining first and second...zone directly translating the change in operator position to a change in position within the virtual environment; and for a positional change of the operator position within the second control zone, translating...

...which an elevated ring (134) is positioned

August 20, 2003

over a border between the first and second **control** zones, wherein **movement** of the **operator** into contact with the ring deflects a portion of the ring into the second control...

...the ring into the second control zone translates to a change in velocity within the **virtual environment**.

27 A method for an operator to control motion within a virtual environment, wherein the...

19/5,K/10 (Item 10 from file: 349)
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00380417 **Image available**
METHOD AND APPARATUS FOR PROVIDING FORCE FEEDBACK FOR A GRAPHICAL USER
INTERFACE -
PROCEDE ET APPAREIL PERMETTANT D'OBTENIR UN RETOUR DE FORCE POUR UNE
INTERFACE GRAPHIQUE HOMME-MACHINE

Patent Applicant/Assignee:
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Inventor(s):

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Patent and Priority Information (Country, Number, Date):

Patent: WO 9721160 A2 19970612

Application: WO 96IB1441 19961126 (PCT/WO IB9601441)

Priority Application: US 95566282 19951201; US 95571606 19951213

Designated States: CA JP MX AT BE CH DE DK ES FI FR GB GR IE IT LU MC NL PT
SE

Main International Patent Class: G09G-005/00

International Patent Class: G09G-05:08; G06F-03:00; B25J-09:18; G05B-19:19;
G05B-19:408

Publication Language: English

Fulltext Availability:

Detailed Description

Claims

Fulltext Word Count: 41434

English Abstract

A human/computer interface device (14) which has a physical object (34), such as a joystick, controlling a graphical object, such as a cursor, within the graphical user interface GUI. A signal (24) is output from the host computer to the interface device to apply a force sensation to the physical object using one or more actuators (30). The force sensation assists the user to select a desired operating system function or physically informs the user of the graphical objects encountered by the cursor within the GUI. A microprocessor (26) local to the interface apparatus can be used to control forces on the physical object.

French Abstract

L'invention porte sur un procede, ainsi que sur l'appareil correspondant, destines a procurer un retour de force a un utilisateur faisant fonctionner un dispositif a interface homme-machine, conjointement a une interface graphique homme-machine (IUG) visualisee par un systeme informatique hote. Un objet physique, tel qu'une manette de jeu ou une souris, agit sur un objet graphique, un curseur par exemple, dans l'IUG. Celle-ci permet a l'utilisateur d'operer une jonction avec des fonctions du systeme d'exploitation mises en oeuvre par le systeme informatique. L'ordinateur hote produit un signal destine au dispositif a interface afin de donner une sensation de force s'exercant sur l'objet physique par le biais d'un ou de plusieurs actionneurs. Cette sensation de force souhaitee, qui se combine avec l'un au moins des objets graphiques et les fonctions du systeme d'exploitation de

August 20, 2003

l'interface graphique homme-machine, est determinee par un emplacement du curseur dans l'IUG par rapport a des cibles associees aux objets graphiques. Au nombre de ces derniers figurent des icones, des menus se deroulant et des elements de menu, des barres de defilement ("glisseurs") ainsi que des boutons. La sensation de force, qui aide l'utilisateur a choisir une fonction du systeme d'exploitation, peut egalement constituer une information concernant les objets graphiques rencontres par le curseur a l'interieur de l'IUG. Il est possible d'utiliser un microprocesseur relevant du dispositif a interface mais separe de l'ordinateur hote pour agir sur des forces s'exercant sur l'objet physique.

Main International Patent Class: G09G-005/00

Fulltext Availability:

Detailed Description

Detailed Description

... paddle 360 can be controlled by host computer system 12, and paddle 362 can be **controlled** by the **user** by physically **manipulating** the **user** object. Ball 352 can be **moved** on display screen 20 according to simulated physical parameters, such as velocity, acceleration, gravity, compliance...

19/5,K/11 (Item 11 from file: 349)

DIALOG(R)File 349:PCT FULLTEXT

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00378697 **Image available**

METHOD AND APPARATUS FOR PROVIDING LOW COST FORCE FEEDBACK AND MECHANICAL I/O FOR COMPUTER SYSTEMS

PROCEDE ET APPAREIL PERMETTANT D'OBTENIR UNE FORCE RETROACTIVE ET UN SYSTEME ENTREE/SORTIE MECANIQUE D'UN FAIBLE COUT POUR DES SYSTEMES INFORMATIQUES

Patent Applicant/Assignee:

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Inventor(s):

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Patent and Priority Information (Country, Number, Date):

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Application: WO 96US17737 19961105 (PCT/WO US9617737)

Priority Application: US 95560091 19951117

Designated States: CA JP MX AT BE CH DE DK ES FI FR GB GR IE IT LU MC NL PT SE

Main International Patent Class: G09G-005/00

Publication Language: English

Fulltext Availability:

Detailed Description

Claims

Fulltext Word Count: 31888

English Abstract

A method and apparatus for interfacing the motion of a user-manipulable object (44) with an electrical or computer system (16). A gimbal mechanism (38) is coupled to the user object (44), such as a joystick or a medical tool, with at least two degrees of freedom. The gimbal mechanism (38) preferably includes multiple members, at least two of which are formed as a unitary member which provides flex between the selected members. An actuator (126) applies a force along a degree of freedom to the user object (44) in response to electrical signals produced by the computer system (16). A sensor (42) detects the position of the user object (44) and outputs sensor signals to the computer system (16). Another embodiment includes a local processor (410) separate from a host computer (16) for communicating with the host computer (16) and

August 20, 2003

controlling the forces output by the actuators according to a processor subroutine selected in accordance with a host command, sensor signals, and timing information. Another embodiment of the interface apparatus (14) uses voice coil actuators (126) that produce forces in either linear or rotary degrees of freedom using currents applied in a magnetic field.

French Abstract

Cette invention concerne un procede et un appareil permettant d'assurer l'interface entre un objet (44) manipule par un utilisateur et un systeme electrique ou informatique (16). Un mecanisme a cardan (38) est couple a un objet utilisateur (44), tel qu'un manche a balai ou un instrument medical, tout en conservant au moins deux degres de liberte. Le mecanisme a cardan (38) comprend de preference plusieurs elements dont deux au moins consistent en un element unique assurant la flexion entre les elements choisis. Un dispositif d'actionnement (126) exerce une force sur l'objet utilisateur (44) selon un degre de liberte et en reponse a des signaux electriques generes par le systeme informatique (16). Un capteur (42) detecte la position de l'objet utilisateur (44) et envoie des signaux de capteur au systeme informatique (16). Dans un autre mode de realisation, on utilise un processeur local (410) distinct de l'ordinateur hote (16) qui va entrer en communication avec ce dernier (16) et regler les forces exercees par les dispositifs d'actionnement d'apres une sous-routine du processeur, laquelle est definie en fonction d'une commande de l'hote, des signaux des capteurs et des donnees de synchronisation. Dans un troisieme mode de realisation de cette invention, un appareil d'interface (14) comprend des dispositifs d'actionnement (126) a bobines mobiles, lesquels vont exercer des forces selon le degre de liberte lineaire ou selon le degre de liberte en rotation a l'aide de courants appliques dans un champ magnetique.

Main International Patent Class: G09G-005/00

Fulltext Availability:

Detailed Description

Detailed Description

... degrees of freedom.

Joystick 112 can be used in virtual reality simulations in which the user can move the joystick to move a vehicle, point to objects, control a mechanism, etc. For example, a user can view a virtual environment generated on a computer screen or in 3D goggles in which joystick 1 12 controls...

August 20, 2003

30/5,K/1 (Item 1 from file: 349)
DIALOG(R)File 349:PCT FULLTEXT
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00404031 **Image available**

METHOD AND APPARATUS FOR PROVIDING SIMULATED PHYSICAL INTERACTIONS WITHIN
COMPUTER GENERATED ENVIRONMENTS

PROCEDE ET APPAREIL POUR PRODUIRE DES INTERACTIONS PHYSIQUES SIMULEES DANS
DES ENVIRONNEMENTS GENERES PAR ORDINATEUR

Patent Applicant/Assignee:

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Inventor(s):

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Patent and Priority Information (Country, Number, Date):

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Application: WO 97US8339 19970516 (PCT/WO US9708339)

Priority Application: US 9617803 19960517; US 96664086 19960614

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LU MC NL PT SE

Main International Patent Class: G09G-005/00

International Patent Class: G09G-05:08; G06F-03:00; B25J-09:18; G05B-19:19;
G05B-19:408; G06F-17:00; G06G-07:48; A63B-71:00; A63B-24:00

Publication Language: English

Fulltext Availability:

Detailed Description

Claims

Fulltext Word Count: 32511

English Abstract

A method and apparatus for providing force feedback to a user operating a human/computer interface device (14) and interacting with a computer-generated simulation (20). In one aspect, a computer implemented method simulates the interaction of simulated objects displayed to a user who controls one of the simulated objects by manipulating a physical object (34) of an interface device (14). The physical object provides force feedback to the user which imparts a physical sensation corresponding to the interaction of the computer simulated objects.

French Abstract

Cette invention se rapporte a un procede et a un appareil servant a produire une force de retour a destination d'un utilisateur actionnant un dispositif d'interface homme/ordinateur (14) et interagissant avec une simulation generee par ordinateur (20). Dans un aspect de cette invention, un procede mis en oeuvre par ordinateur simule l'interaction d'objets simules presentes a un utilisateur qui commande l'un des objets simules en manipulant un objet physique (34) d'un dispositif d'interface (14). L'objet physique fournit a l'utilisateur une force de retour qui donne une sensation physique correspondant a l'interaction des objets simules par ordinateur.

Fulltext Availability:

Claims

Claim

... is trapped as if said paddle is a flexible sling, and wherein when said trap command is removed while said ball object is moved by said user in an approximately circular path, said ball object is disengaged and moved tangential to said circular path away from said paddle object.

53 A method as recited...

August 20, 2003

30/5,K/2 (Item 2 from file: 349)
DIALOG(R)File 349:PCT FULLTEXT
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00401876 **Image available**

VIRTUAL MOTION CONTROLLER

DISPOSITIF DE COMMANDE DE MOUVEMENTS VIRTUELS

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FURNESS Thomas A,
PULKKA Aaron K,
LAMAR Michael,
ATEN Jason,

Patent and Priority Information (Country, Number, Date):

Patent: WO 9742620 A1 19971113

Application: WO 97US7419 19970502 (PCT/WO US9707419)

Priority Application: US 9616954 19960506

Designated States: AL AM AT AU AZ BA BB BG BR BY CA CH CN CU CZ DE DK EE ES
FI GB GE HU IL IS JP KE KG KP KR KZ LC LK LR LS LT LU LV MD MG MK MN MW
MX NO NZ PL PT RO RU SD SE SG SI SK TJ TM TR TT UA UG UZ VN GH KE LS MW
SD SZ UG AM AZ BY KG KZ MD RU TJ TM AT BE CH DE DK ES FI FR GB GR IE IT
LU MC NL PT SE BF BJ CF CG CI CM GA GN ML MR NE SN TD TG

Main International Patent Class: G09G-005/00

Publication Language: English

Fulltext Availability:

Detailed Description

Claims

Fulltext Word Count: 9356

English Abstract

A motion control device (16) for a virtual environment, robot or vehicle. The controller allows the user enough movement in the real world to create a sense of reality and presence in the virtual environment. A user is positioned on a surface and is able to move within multiple control regions (24, 26). The virtual environment, robot or vehicle responds differently to inputs from a first control region (24) than from a second control region (26).

French Abstract

Cette invention concerne un dispositif de commande de mouvements (16) pour un environnement virtuel, un robot ou un vehicule. Le dispositif de commande donne a l'utilisateur une liberte de mouvement suffisante dans le monde reel pour creer une impression de realisme et de presence dans l'environnement virtuel. Un utilisateur se trouve sur une surface et peut se deplacer dans plusieurs zones de commande (24, 26). L'environnement virtuel, le robot ou le vehicule repondent differemment aux entrees selon qu'elles proviennent de la premiere zone de commande (24) ou de la deuxieme (26).

Fulltext Availability:

Detailed Description

Detailed Description

... virtual environment including, simulation environments, game environment, virtual reality environments or other graphical environment. An operator provides inputs to control movements and enter commands in the virtual environment through the input device 16. The processors 18 process the inputs to control what is...

...display device 14 provides visual feedback to the operator. Although other mechanisms for feeding back virtual environment information can

August 20, 2003

be implemented, this invention addresses the input device 16 the operator controls to provide input to the host processing system 12. Although a **virtual environment** host is described, the input device also is used for **remote** control of a robot or vehicle via direct view or via a displayed view.

The...

...example, the input device surface 20 is designed to resemble a surfboard for a surfing **virtual environment**. Fig. 2 shows a circular surface 20. ...24, 26. The processor 18 receives input signals from the sensors 22 to determine an **operator** position on the surface 20. **Movement** of the **operator** position within a first **control** zone 24 is processed with a first transformation function. **Movement** of the **operator** position within a second **control** zone 26 is processed with a second transformation function. The specific transformation function may vary depending on the **virtual environment** or **remote control** implementation. In a specific embodiment, **movement** of the **operator** position within the first **control** zone is directly transposed to **movement** within the **virtual environment** or of a robot or vehicle. For example a 1 to 1 ratio of movement...

...movement in the first control zone is implemented as a 5 foot movement in the **virtual environment** or of the robot or vehicle. The relative size, shape and location of each control...